

THE IRON AGE

THURSDAY, APRIL 25, 1889.

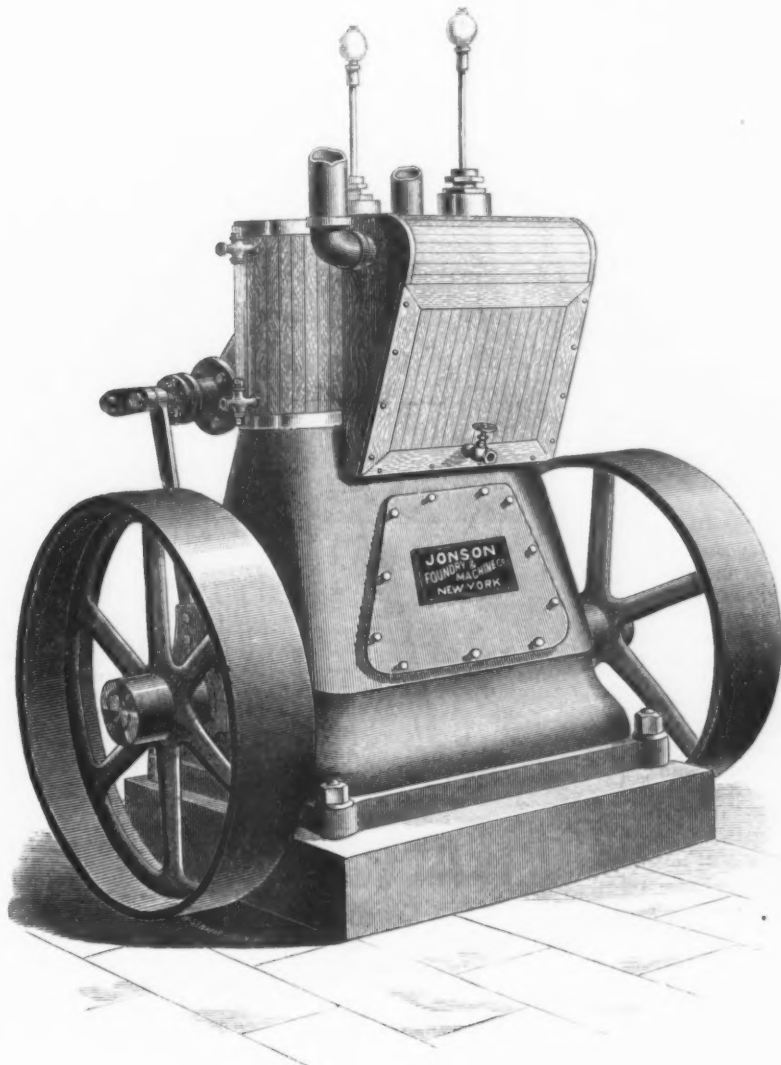
A New Aluminium Process.

London *Industries* says that "in the course of a discussion upon a paper read by Mr. W. Anderson, before the Society of Arts last week, on the Deville-Castner aluminium process, Mr. Alexander Siemens described a new process invented by Mr. Grabau, who heated fluoride of aluminium in presence of sodium. The melted sodium was poured into the vessel, which was lined with cryolite, and cooled by

the sulphate of sodium and left the aluminium fluoride ready to be reduced. The advantages of this process were that all the materials were treated at a comparatively low temperature, about 900° Celsius. The vessel in which the aluminium fluoride was heated, as well as the vessel in which the reaction took place, was lined with cryolite, so that there was no danger of impurities being incorporated into the aluminium. The low temperature was very much easier managed than the

Balanced Compound Engine.

The Jonson patent balanced compound engine, of which we herewith present illustrations, is manufactured by the Jonson Foundry and Machine Company, of New York. This engine is of the trunk type and consists virtually of four half cylinders with cranks set opposite or 180°, forming in fact an equivalent for the ordinary high and low-pressure cylinder; the area of the annular space between the trunk and



BALANCED COMPOUND ENGINE, BUILT BY THE JONSON FOUNDRY AND MACHINE COMPANY.

water; and the heated fluoride of aluminium, in the form of powder, was thrown upon the melted sodium. Very violent reaction took place, the heat generated by the reaction being sufficiently great to melt the aluminium as well as the by-product. As soon as the reaction was complete, the whole molten mass could be poured out into suitable forms and the aluminium settled at the bottom and the cryolite at the top. To obtain the fluoride of aluminium Mr. Grabau used the cryolite, which he procured by the final reaction by putting the powdered cryolite into a solution of sulphate of aluminium. The reaction which took place between the sulphate of aluminium and the cryolite gave the aluminium fluoride. The solution was afterward evaporated, and the residue was washed with water, which took out

high temperatures of the Castner process. The Grabau process of course required the action of sodium, and the inventor was engaged in experimenting upon a new process to prepare this. A factory was at work near Hanover producing aluminium on a commercial scale."

The Queen and Crescent Route has issued a circular announcing a change of rates to a number of points, which took effect on the 1st inst. Among them we note Alton, Ill., \$3.70 from Birmingham, and \$3.45 from Chattanooga; Beloit and Janesville, Wis., \$5.25 and \$5; Massillon, Ohio, \$4.35 and \$3.85; Ottumwa, Iowa, \$5.25 and \$5; Rockford, Ill., \$5 and \$4.75; Vandalia, Ill., \$4.25 and \$4, and Wabash, Ind., \$4.15 and \$3.65.

low pressure or compound cylinder being equal to that of the high-pressure cylinder. Thus in the engine in the accompanying cut the compound cylinder being 12½ inches in diameter, the trunk 9½ inches scant; the difference in areas, 122.72—72.72=50, or nearly 8 inches, making this engine 8 x 12½ x 10 inches stroke. Steam is exhausted from the high-pressure end of each cylinder to the upper or compound end of the same cylinder, so that alternately the high-pressure end of one cylinder and its opposite compound one form a complete half stroke.

Except for electric lighting purposes, or for very large sizes where the slide-valves are of great area, the manufacturers make the high-pressure steam and compound valves in the same casting, passing the high-pressure exhaust through

ports in the valve to the low-pressure end, and by giving the steam, compound and exhaust valves a definite lead, as determined by practice, the working of both cylinders in unison is always assured. But the two valves being in the same casting and driven by a single eccentric, or in the case of the marine engine by two eccentrics, and the ordinary link motion, any change in this motion, as in using an automatic cut-off, affects the compound and exhaust as well as the live steam, and it is therefore preferable to use for this purpose an independent steam valve as shown in the cut. On marine engines the ordinary adjustable cut-off is used. Where, as above stated, the valve area is very large the valve is divided. In the case of an engine of 275 horse-power, which the above company are now building for the Government for an iron steam tender, the ordinary piston-valve is used for the live steam and a slide-valve for the compound. The advantages of this type of engine are compactness, freedom from vibration, very low center of gravity, and as all the moving parts are exact reproductions of each other, it is perfectly balanced and can be run at a very high rate of speed, making it especially valuable for electric lighting. The engraving does not show the automatic flywheel governor, as it is not an essential feature of the engine and as it is well understood. When testing this engine it was belted to a dynamo requiring 35 horse-power to run it. No variation could be detected in the speed of the engine when the entire load was instantly thrown on or off by the movement of a switch.

The Lead Cables in the Berlin Central Stations.

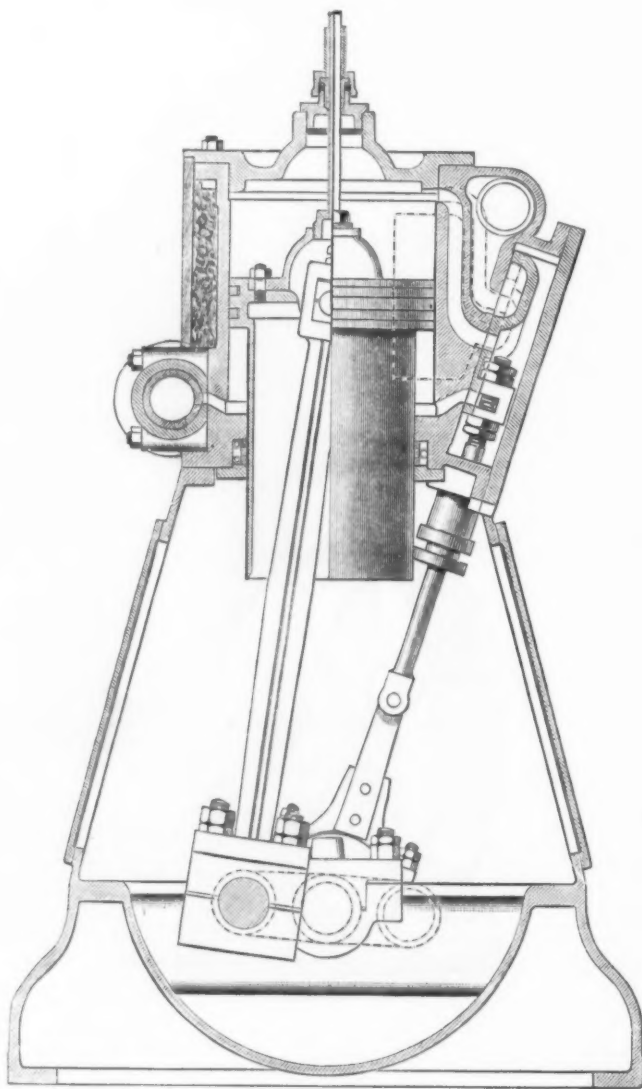
As was to be expected, the announcement which Professor Forbes made at a recent meeting of the Institution of Electrical Engineers in London, regarding the failure of the Berlin cables, has created a strong feeling of indignation among German electricians, and the feeling found vent at the last meeting of the Electro-Technical Society, held in Berlin. On this occasion Dr. Werner Siemens read a paper on "Underground Electric Light Mains," and gave a categorical denial to the statement that lead cables are destroyed by electrolytic action within three years from the time they are first put underground. In the Berlin system of underground mains four failures have occurred, but these have been all due to mechanical injury; and owing to the want of proper supervision, and especially owing to the impossibility of performing frequent tests where the mains of different districts are all coupled together as in Berlin, the faults were not detected in time to prevent failure. Out of the total of 130 km. of lead cables in Berlin, only 200 m. had to be replaced, and now the network of lead cables is again in perfect condition. In other places cables of this kind have been in use for nearly five years, and their insulation now is as perfect as when they were first put down. Dealing with the probable future extension of electric supply, Dr. Werner Siemens gave it as his opinion that in a short time the available space under the streets of large towns will not suffice for the accommodation of the various cables, gas and water pipes and sewers, nor will the surface of the streets suffice for the increased traffic, and he looks forward to the rearrangement of large towns, where there will be streets on two levels. The new streets, either over or under the existing ones, are to be exclusively used for express service with electric tramways, and for the placing of the various conductors for telephony, telegraphy, light and power, gas, water, compressed air and steam. At the same meet-

ing Herr O. von Miller read a paper on the recent extension of the Berlin electric works, which have now a capacity of 4000 horse-power, sufficing for the supply of 50,000 lamps wired. During the present year six new dynamos, representing 4600 horse-power, will be installed, and this will increase the capacity to 100,000 lamps by the end of the year. The buildings are, however, large enough to admit machinery for a capacity of 200,000 lamps.

Rusting of Rails in Tunnels.

M. Savioz, chemist of the St. Nazaire works, France, recently completed an interesting series of experiments on the rust-

that the influence of carbon and manganese on the rusting tendency is slight, a variation of carbon of from 0.18 to 1.10 per cent., and of manganese from 0.26 to 1.15 per cent., the proportions of sulphur, phosphorus and silicon remaining the same, showing no appreciable difference in behavior of the samples. With increasing percentage of phosphorus, on the other hand, a decided tendency to oxidation was observed. The small number of tests, however, did not admit of the formulation of any law. The tests showed, further, that samples from the upper ends of the ingots were more readily attacked than those from the lower ends, and that wrought iron, with which also comparisons



VERTICAL SECTION OF JONSON'S BALANCED COMPOUND ENGINE

ing of steel. The method followed consisted in exposing the metal to the action of acid waters, and observing the reduction of weights. The results showed throughout that the proportion of phosphorus present exerted an appreciable influence on the behavior of the metal. Since rails in long tunnels are undoubtedly exposed to the action of dilute sulphuric acid, the phosphorus percentage may be accepted as one of the causes of their rapid oxidation, and Savioz' researches are accordingly noteworthy. The *Organ fuer die Fortschritte des Eisenbahnwesens* publishes two tables giving the results obtained by him. One set of tests was made with Bessemer and Siemens-Martin steel sheets of varying thickness and chemical composition, and the other with test pieces of similar material, two pieces being taken from each ingot, one from the upper and one from the lower end. The figures show

were instituted, was less affected than steel with 0.17 per cent. of phosphorus, but considerably more than steel samples ranging in phosphorus between 0.05 and 0.08 per cent. The tests, we should add, were made with a mixture consisting of one part of hydrochloric acid to five parts of water, and extended over 24 hours each.

It is reported that the present owners of the Shelby Iron Company, the producers of the well-known charcoal iron, at Shelby, Ala., are willing to sell their interest in that remunerative property, at a relatively low price.

The Standard Oil Company have contracted with the Riverside Iron Works, of Wheeling, W. Va., for 25 miles of steel pipe for one of their pipe lines near Warren, Pa.

The Krupp Works at Essen.

The city of Essen lies northeast of Düsseldorf, and is reached from Brussels by way either of Cologne or Gladbach. It is situated in the fertile basin of the Ruhr, near Duisburg, another manufacturing city. Indeed, Essen is in the center of the great factory district of Westphalia, a veritable hive of industry, in which are also to be found Crefeld, Elberfeld and Dortmund. These are not the only noticeable features of Essen's position, for it lies in one of those fortunate regions in which Nature has stored abundant coal and iron, the very basis of metal working. To the Krupp Works Essen owes its world-wide reputation, and in a great measure all its prosperity. In 1862 its population scarcely reached 1700, but the number of workmen employed in the great foundry increasing from day to day, the little town did not cover sufficient ground to shelter them all, and rapidly expanded. In ten years the population doubled, and to-day, encircled by a belt of attractive suburbs, the old city contains nearly 100,000 people. The impression is at once received that the whole town is more or less dependent upon the works.

From a work recently published, entitled "Krupp and De Bange," we take the following data concerning some of the equipment of the furnace establishment. Though the description is not technically accurate and does not convey any new facts, it is vividly written and is interesting, as it reflects the impressions of one to whom the sights of a large works have not become a familiar matter:

In a part of the gun shop, first entered, the great guns are majestically enthroned; the leviathans of naval armament, the behemoths of coast defense. Man feels his insignificance in the presence of these awe-inspiring engines, yet he is their lord and master. Among all these finished masses of pure steel, at whose sides a horde of mechanics are busy, four especially rivet the attention of the beholder; they are the 40 cent. guns, 14 m. long, and weighing a trifle over 120 tons, say 120,000 kg. And yet but a few years ago the 100-ton iron gun with steel lining, made by Sir William Armstrong for the Duilio, was emphatically announced as the supreme effort in the struggle of ordnance against armor, the final outcome of constructive ability. Here the metal is not iron, but steel entirely, and crucible steel at that. The charge of each crucible is only 40 kg., and the reader can picture to himself the amount of work embodied in each of these pieces in remembering that the casting of each involves the simultaneous pouring of from 1700 to 1800 crucibles, yielding an ingot of 70,000 kg. As each gun consists of tube, mantle and rings, this Titanic operation must be repeated twice for each piece, as the rings alone permit the use of much smaller ingots. The ponderous blocks of steel required for these enormous guns are nevertheless forged and finished with comparative ease, so great is the capacity of Krupp's tools and so daring the intelligence which directs them. These guns were ordered by the Italian Government for the seacoast defense.

THE CARRIAGE ASSEMBLING SHOP.

We regretfully left this interesting sight to enter another structure, in which are the assembling shops for naval and seacoast carriages. Communicating galleries are built at a height of 10 m. between the shops. From one of these we glanced above us at the traveling cranes of 50,000 and 30,000 kg. capacity, which, at a height of 15 m. and with a span of 22 m., traverse the great shops, lifting and shifting the heaviest masses, working automatically by bell signals. Below us we see in hand a carriage with rotating platform protected

by a sheet-steel cupola. This model is designed for a great ironclad, the pride of modern navies. Other carriages of established model, with hydraulic buffers and shot-cranes, are ready for the cars. Let us go down to get a nearer view of the work of assembling; let us see how the cupola turns on its rollers. Stop, it is moving. "She doesn't work badly," said the foreman, "a little filing here and there and she's all right." Above us the crane advances, goes back with impressive deliberation, making nothing of its huge loads, and, from time to time, the click of gearing and the ringing of a small bell reveal the existence of the train that moves this indispensable apparatus; and everything goes apparently in a routine way, quietly, without excitement or shouting; little is said in the Krupp establishment, but the work goes on all the same. At the four corners of the edifice ponderous lifts are installed, and, taken all in all, we are sure that there could not be a better disposition of the powerful mechanical devices which science has placed in the hands of the constructor. But let us hasten to examine the various processes of steel-making in use here, for the Essen Works turn out Bessemer, open-hearth, puddled and crucible steel.

THE BESSEMER PLANT.

Bessemer steel is made on a great scale at Essen; 10,000 tons of rails can be made per month. This shows that Krupp is not unwilling to take advantage of scientific progress in whatever direction it tends, and does not disdain to make cheap steel to meet the wants of all railroad interests. But we must make no mistake; he uses the Bessemer process only for making commercial brands. Interested parties have started a rumor that the crucible steel, which alone is used for gun metal, is made in part by remelting Bessemer scrap. We have assured ourselves by watching the charging of crucibles that this rumor is entirely baseless. It would be still more audacious to assert that the converters furnish the ingots required for tubes, mantles or even rings, for we looked in vain for molds at the Bessemer works of sufficient size for the purpose, or for cranes powerful enough to handle the great blocks out of which the gun parts are fashioned. The fact is apparent that the works are especially equipped for the output of the small ingots required in rail fabrication.

THE OPEN-HEARTH PLANT.

Krupp also makes steel by the Martin-Siemens process, which, besides affording facilities for determining the character of the bath by the drawing of test specimens, yields a more constant and homogeneous product than the Bessemer. It is slower, we must admit, but it is more certain; the carbon point can be so regulated that we can obtain the hardest as well as the softest metal, steel suitable for springs or for boiler plates. The open-hearth plant is extensive and well arranged. The reverberatory furnaces, in which the molten metal simmers under the action of the flame, are arranged in two rows, having between them cranes of medium capacity; under these are the casting pits. Here, as at the Bessemer plant, there is no sign that open-hearth steel is used for gun metal; no deep pits, no gigantic cranes. Not a particle of this steel goes into the crucibles; we assert this without fear of denial, for we have at hand convincing evidence. Open-hearth steel is used at Essen for the fabrication of all kinds of plate, tires, axles and other structural parts; also for all castings, such as car-wheels, crossheads, hydraulic cylinders, and, in general, for all machine members which do not need that absolute homogeneity and exceptional strength demanded by gun metal, and which so especially characterize crucible steel. As we

entered the foundry the work was in full swing; the furnaces flamed with dull crackling, and the crane moved along the great bay, holding suspended the pouring ladle; at intervals, when above the mold, a stream of molten metal gushed out momentarily, as with a lightning flash, making darkness visible, and disappeared in the glowing receptacle. In front of the works numerous castings, just from the molds, were slowly cooling under slag; they were truck-wheels. These castings are not to be trusted, inoffensive as they look; they remain hot for a long time, and those who walk about carelessly are apt to carry away ardent and lasting reminders.

THE PUDDLED-STEEL PLANT.

It is easily understood that the portion of the establishment devoted to crucible steel making, the metal of which all Krupp guns are constructed, possessed the greatest attraction for us. Besides, with or without reason, all sorts of myths attached themselves to this mysterious metal, and the probabilities are that had the famous gun-maker lived in the dark ages his unlucky competitors would have accused him of witchcraft, and the stake would have effectually disposed of an inconvenient rival. The iron ores used by Krupp in the fabrication of his gun metal are of the very highest grade and of remarkable purity. As a rule, hematite and spathic ores are used, the same ores from which that excellent cast iron, called by Germans *spiegeleisen* and by the French *fonte miroitante*, is made. They come either from the Siegen region or from the firm's mines near Bilbao, in Spain. The iron is delivered at the works in pigs, and makes up the charge of the puddling furnace. The puddling is under control of experienced and tried workmen; indeed, a regular puddling school exists at Essen; no one can become a boss until, after numerous and difficult trials, he has proved himself thoroughly up in all the details of the art. Of course puddled steel is made at Essen upon the same scientific principles as in England, France or Belgium. While science is the same everywhere, each mill has its own special "knack" which characterizes its output. We will go a step beyond, and affirm that were Krupp to establish works in some foreign country, without taking with him his mechanics, his ordnance experts, and his foremen, many of them born within sight of his establishment, most of whom have grown gray in his service, the steel he would there make would be different from that produced to-day at Essen. The determining conditions are indigenous to the soil and dependent upon the generations of workmen evolved under their influence, just as the tree clings by its roots to its mother earth.

Let us, however, return to the iron about to be partially decarburized in the furnace. It is vigorously assailed by the fire, and thoroughly rabbled by the puddler; the excess of carbon is driven off, and the iron becomes steel. The skill of the puddler lies in stopping the operation at the exact moment when the iron comes to nature; if this passes the work is lost. The loop, or ball, as the spongy steel mass is called, is carried on a trolley to the steam hammer, the metal is squeezed under its blows, and slag and other impurities are expelled, the molecules are condensed, arranged, and rammed together, and the ball becomes a billet. This hammered billet is then taken to the rolls, and leaves them as a long, square rod, which is at once hardened in a pool occupying the center of the mill. Each rod, after critical inspection as to quality, is broken into pieces about 20 cm. long, which are sorted accordingly. The toughest and most homogeneous are reserved for gun-metal charges; the others are classed for special

work, such as crankshafts, axles, high-grade tires, &c. The advantage of this procedure is self-evident; the expert can, so to speak, after the crucible charge has been fixed, determine beforehand the strength which the melt will possess, and, as it is worked in small masses, there is the greatest possible chance of securing almost perfect compactness.

The puddling works always present a busy appearance; the steel bubbling in the furnaces is energetically stirred and worked by the rabbles of the puddlers. These are fine fellows, all nerve and muscle, whose perspiring faces, occasionally lighted up by a sudden flash of flame, bear testimony to the hardships of their trade. Here the steam hammers angrily pound the unwilling billets; further along the glowing bars writhe in audible agony through the roll grooves. Add to this the whirring of the pulleys, the clanking of the chains which hold the roll tongs that guide the heavy masses of steel, the calls of the bosses, the chant of the hundred ovens in which iron and coal crackle, the heavy puffing of the steam motors, and you have a picture in ever-varying colors of one of the most magnificent phases of modern industry. Puddled steel, which by the very principle and method of its fabrication is assured great uniformity, is the base of the crucible charge; the rest of the alloy is puddled iron. This is made of special pigs, and worked in the manner just described; it gives tenacity to the compound. It is rather refractory, but the puddled steel, the greater part of the charge, has a comparatively low melting point and a certain flux, one of Krupp's "secrets," is added. We came to the conclusion that charcoal was its main ingredient. The crucible, whose contents weigh exactly 40 kg., is carefully luted, heated in the warming oven and is then exposed to the high temperature of the melting furnace.

CRUCIBLE MANUFACTURE.

This is the proper time to speak of the melting pot, the crucible. It is made of a special composition, peculiar to the Krupp Works. We witnessed the manufacture, and came to the conclusion that the mixture consisted mainly of fire-clay with a less proportion of graphite. The material of which the crucible is made exercises a great influence upon the final constitution of the melted contents. Krupp has made this a subject of exhaustive investigation, for the works consume an enormous number of crucibles, as each can be used but once. No further evidence of this is needed than the piles of charged and broken pots stacked in the shop yards. A part of this waste material, however, is utilized; it is ground into powder under huge vertical stones, and is thus rendered fit for use in making new crucibles. New composition and old dust are ground fine, mixed in great vats and thoroughly worked up with the utmost care into a thick, pasty slip. The crucible is now to be molded. Imagine a hollow cast-iron truncated cone, the mold, and a solid metal core of suitable size and similar shape, which fit to just the dimensions of the prescribed crucible. Now fill the mold with the proper quantity of slip and slowly enter the core, the compressed plastic material flows between mold and core and shapes itself; the excess seeks to escape, but is held by a collar and forms the rim. The pot is then taken out of the mold and dried. The works, as already stated, consume daily a very large number of crucibles, for as a rule four crucible casts are made every 24 hours. The drying and storing rooms are in immense four-story edifices with spaced flooring, on which the crucibles stand in long rows. The superintendent of this important branch told us that there were already 100,000 crucibles in store, which are used in succession. We could not verify this

statement, but we are sure that it would have taken us hours, possibly a whole day, to count them.

THE CRUCIBLE-STEEL PLANT.

We come now to crucible casting, which in every way is the most singular, the most interesting and the most picturesque work we saw during our whole visit. The foundry stretches out almost interminably, and is furnished with all the apparatus necessary for the successful carrying out of this delicate and difficult work. Upon the extended sides, along the walls, are installed the gas heating ovens; parallel to them in two lines are built the melting ovens flush with the ground, and connected by subterranean galleries for the service of the attendants. The Krupp establishment uses in its crucible-steel plant about 130 coke and 30 gas ovens. Each oven has a capacity of 12 crucibles. Some, however, can hold 18, so that casts of from 1600 to 1800 crucibles, even more if necessary, may be easily undertaken. The largest steel blocks cast at Essen up to the present time weigh 70,000 kg., required in the construction of the 120-ton guns. About 1700 crucible charges were needed in casting them. Along the center line of the structure the casting pits are dug and the movable cranes are located. The process of casting is in itself of absorbing interest; it is a striking illustration of the precision and coolness of the master founder, of the discipline and skill of the workmen.

When the steel in the crucibles has reached the desired melting temperature, after being from four to five hours in the furnace, the master founder places the mold, as near as may be, equidistant from the active ovens. He then sets up the casting runners, heavy sheet-iron channels lined with fire-brick. These runners lead the liquid metal in corruscating streams to the gate which surmounts the mold in which they are engulfed. The foundry-men are dressed in two long lines, facing to the center, and divided into threes and twos. One of each three carries a tongs, the others a rod, very much like a brewer's mash ladle. As soon as the master founder has completed his preparations, and upon inspection ascertains that the proper melting point has been reached, he gives the signal, the oven covers slide back and the casting begins. The melter with the tongs clasps the crucible, and resting the curved tong handle upon the rod, held by the other men as a fulcrum, he lifts it out of the oven. Keeping it vertical, the three place it on the ground some distance from the furnace. Then the other two take it, and pour its contents into the runner. The empty pots are thrown in a heap out of the way of the workmen. Group silently follows group; the crucibles shimmer through the foundry in a meteoric shower; the silence is broken only by the clatter of the sliding oven covers and the crackling of the molten streams as they glide in the runners toward the flask, into whose fiery mouth they plunge in a glittering cascade.

THE 50-TON HAMMER.

A word about the 50-ton hammer, so long the boast of the Krupp Works. Imagine a square steel head, 3.70 m. long, 1.50 m. wide and 1.25 m. deep, a mass of 7 c.m., hung at a height of 12 feet in an arch 5 m. high, whose supports are 1.50 m. in diameter. Now a steel anvil, resting upon successive foundations of masonry, oak—a whole forest was required—and cast iron; finally, in your mind's eye, put the glowing ingot under the hammer head. The hammer boss, a veteran artist in blue glasses—for it is impossible to watch the incandescent mass with the naked eye—is in direct charge. At his right and left are the men who grasp the chains encircling the monster, and who, at a hand wave, without a word or order, oscillate the block until the desired position is at-

tained. The hammer slowly descends, the head hardly touches the ingot, then, after a rapid inspection, it is quickly raised and comes down with all its might upon the metal, which quivers and gives under its terrible blows. About the hammer the ground trembles as with an earthquake wave. Stop! the hammer rests, the block is turned on its side, the machine takes breath again, like a Colossus raising his club to brain the enemy, and pounds again upon the bruised mass, which finally gives way under this storm of blows; the block is forged.

The 50-ton hammer was built about 20 years ago and cost the small sum of \$500,000, but it must be admitted in excuse that it earns its living honestly and pays good interest on its cost. At that time Creusot had only a 12-ton hammer; however, there are 80 and even 100 ton hammers. "Why," it is asked, "does Krupp suffer himself to be outdone by his rivals?" We must first note that the Essen hammer has really an effective weight of 60 tons, and the heaviest blocks forged weigh, as already mentioned, 70,000 kg. These blocks are bored; the forging can therefore be altogether effective, for the hammer blows need not penetrate to the heart of the block. Further, the monster guns now constructed date back only a few years. Altogether, up to the present, more powerful mechanical contrivances were not required; yet for some time past Krupp has contemplated erecting a hammer of much greater weight, and the matter is so far advanced that within a few months Essen will again surpass its rivals in its ability to forge the very heaviest steel masses. It would hardly be proper for us to say more on this subject. After forging the shapes are subjected to a peculiar annealing process, and are then transferred to the gun-shops for finishing and assembling. We will not dwell upon the other products of the works—steel cast wheels, coil and elliptical springs, tires, &c.—all abounding in interest, and which in themselves justify Krupp's great reputation. We examined the entire plant with sustained interest, but we cannot within the scope of this paper undertake to impart our impressions.

The theory of Dr. F. C. G. Mueller concerning the character of the gas occluded in steel has been confirmed in a striking manner. The inventors of the famous Mannesmann method of making steel tubes, by rolling them excentrically from a solid bar, sent to the Charlottenburg laboratory two tubes closed at both ends, a partly finished product, therefore. The steel contained 0.46 carbon, 0.25 silicon, 0.022 phosphorus, 0.01 sulphur, 0.23 manganese and a trace of copper. The hollow cavity contained 9.11 c. cm. of gas at a pressure of 760 mm. Chemical analysis showed that this gas was composed of 99 per cent. of hydrogen and only 1 per cent. of nitrogen, confirming Mueller's theory that the gas occluded in steel castings is hydrogen.

An important act for the protection of minority stockholders and the securing of publicity in corporate affairs has been passed this month by the Legislature of Massachusetts. Hereafter the officials of every company chartered in that State will be required to file at the State House, on the request of any stockholder, between 30 and 60 days before its annual meeting, complete lists of the shareholders, with their residences and the number of shares belonging to each. These statements are to be made in a form approved by the commissioner of corporations, and are to be sworn to. The penalty for neglect to file the required lists is a fine of \$1000 against the corporation and the same sum on the delinquent official.

New Punching Press.

The accompanying engraving represents a new punching press built by E. W. Bliss Company, of Brooklyn, N. Y., intended for use in the manufacture of iron boilers, tanks, smoke-stacks, and other sheet-iron and steel work. With it holes can be

plied for a patent, which was still pending; that his furnace bore the device "Patent applied for," and that the manufacture of the furnace by the defendant was an infringement. In dealing with the case whether an inventor can maintain a bill for an injunction before the issue of a patent, Judge Brown decided adversely,

tion is simple and places the engine under quick control. These engines are made in sizes from $\frac{1}{2}$ to 20 horse-power.

The Boiler-Makers' Meeting.

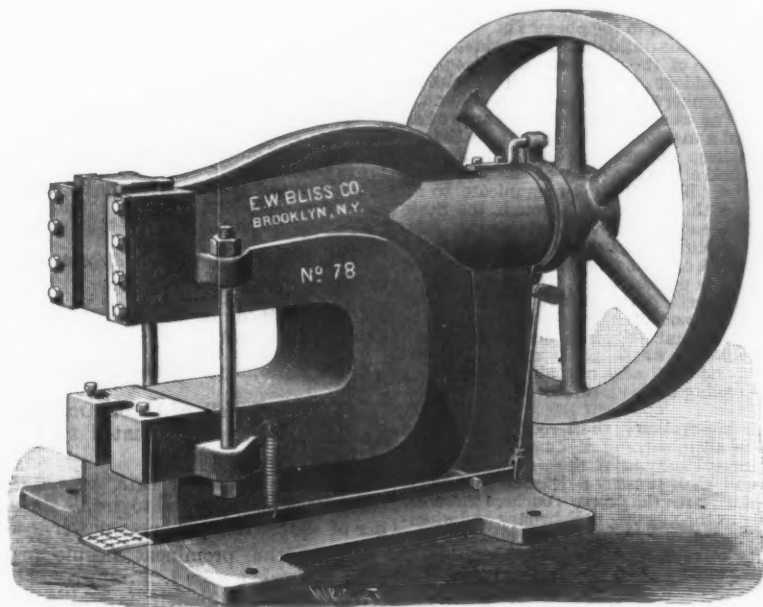
In response to a call issued by A. T. Douthett, secretary of the Porter Foundry and Machine Company, Limited, of Allegheny City, Pa., the boiler manufacturers of the United States met at the Hotel Anderson at 9 o'clock a.m., on Tuesday, the 16th inst., and at once proceeded to organize themselves into an association. James Lappan, of Pittsburgh, was chosen president; A. T. Douthett, of Allegheny, Pa., secretary, and Messrs. Rohan, St. Louis; Marshall, Dayton, Ohio; Cunningham, Brooklyn, N. Y., and Hartley, Philadelphia, Pa., vice-presidents. Committees on organization and resolutions were appointed, consisting of the following members: Messrs. E. D. Meier, J. R. Brownell, R. Hammond and James Barahill, organization; Philip Rohan, Geo. Marshall, H. J. Hartley, John Over, J. P. Jefferson, R. Monroe and A. T. Douthett, resolutions. After the appointment of these committees the meeting adjourned until 2 o'clock p.m.

The convention upon reassembling in the afternoon received the reports of the committees appointed in the morning. The Committee on Permanent Organization made quite a voluminous report, the substance of which will be given hereafter in the constitution and by-laws. The resolutions drafted by the committee appointed for that purpose made the following report, which was unanimously adopted:

WHEREAS, No business calls for greater care, better material in the construction of its commodity and more exact workmanship than ours; and in view of the fact that so many disastrous explosions have occurred in the past where materials afterward tested have been shown to be of an inferior quality; therefore, that we may better secure safety to the lives and the property of every community where boilers are used, be it

Resolved, That we will in all cases use the best material in the construction of boilers, refusing to accept contracts where specifications do not call for material of suitable quality.

Resolved, That it is the sense of this convention that the system of inspection prescribed by the United States marine laws should be adopted with but few exceptions.



PUNCHING PRESS, MADE BY THE E. W. BLISS COMPANY.

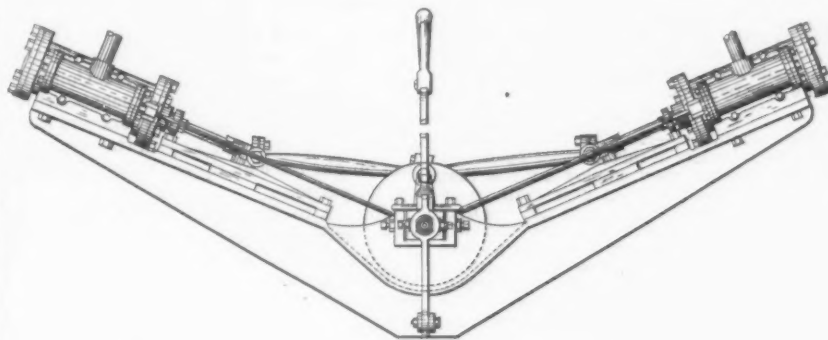
punched in sheets 24 inches from the edge, and when the stay-bolts are used heavy sheets may be punched 7 inches from the edge. The machine is also useful in riveting iron lattice and framework as used in fitting up offices, elevator shafts, &c. The wheel is 54 inches in diameter, weighs 900 pounds, and is locked to the forged steel shaft by a new patented clutching device that is positive in its action and exceedingly powerful. Four locking grooves are provided in the hub of wheel, thus preventing any loss of time in starting, and a friction collar on the shaft insures the stopping of the slide at the top of stroke every time. When made as shown in cut its weight is 4500 pounds, and when geared for heavy work it weighs 5500 pounds.

"Patent Applied For."—A practice widely followed is to attach to an article manufactured the words "Patent applied for," with the idea that it protects the invention until a patent is issued. In the United States District Court at Detroit Judge Henry B. Brown has just rendered a decision bearing upon the value of this system. The case in which the question arose was that of Barnard Rein and Asa W. Straight vs. Clayton and Lambert. It appears that in August, 1887, Straight went to Clayton, who at one time was employed as foreman of Drury & Taylor, and showed him a burner invented by him for use as a vaporizer on a gasoline stove, to be applied to plumbers' hand furnaces. Clayton made one, which he used for some time. In the spring of 1888 Clayton went into business for himself, and as an adjunct commenced making furnaces for Straight, adding some improvements on it. The exclusive sale of the furnace was given to Lambert & Sons, and as great improvements, in addition to others, suggested themselves to Clayton, he resolved to make a furnace of his own, and in September, 1888, took Lambert & Sons in with him and commenced to make furnaces, having applied for a patent on the same. Straight asked for an injunction to restrain Clayton & Co., alleging that he had already ap-

entering a decree denying the injunction and dismissing the bill for want of jurisdiction.

Launch Engine.

The engine of which we herewith present an outline drawing is manufactured by Lombard Bros. & Co., of Boston, the sole agent being John J. Bockée, of 47 Dey street, New York. The bed of the engine is cast in a single piece, the angle being such as to conform as closely as pos-



LAUNCH ENGINE, BUILT BY LOMBARD BROS. & CO.

sible to the sides of the boat. By this construction the shaft is brought to the lowest possible point in line with the keel, while at the same time the bed acts as a brace or stiffener to the boat, thereby increasing its strength at that point where the vibrations and weight make it most needed. The cylinders being arranged at the angle shown in regard to each other, there is no dead-center. The valve eccentric is so connected by feather and spiral groove as to be shifted by the movement of a centrally-placed lever. The engines can be started, reversed and stopped by the movement of this bar, which controls the relative position of the valves. The construc-

Resolved, That we recommend all manufacturers of iron and steel boiler plate to make but one brand, which shall have a tensile strength of not less than 55,000 or more than 65,000 pounds to the square inch, and that the same be stamped with the initial letters found in the name of this association—viz., A. B. M. A., and that this brand be sold to the members of the organization only.

Resolved, That we use all honorable means in influencing our representatives in Congress to procure the passage of such laws as will make it a criminal offense, punishable by fine and imprisonment, to manufacture or sell iron or steel of an inferior quality for boilers, and a similar offense, punishable in like manner, to make boilers for any purpose of an inferior quality to those specified by such laws.

Resolved, That we invite all manufacturers of boilers to join our association, knowing as

we do that our object is purely philanthropic, and that we are bestowing one of the greatest blessings upon the public at large, who should look with distrust upon any manufacturer who, by reason of personal motives, refuses to take this important step.

At the evening session the Committee on Constitution and By-Laws, consisting of Colonel Meier, P. Rohan, Brownell and Bornhorst, presented the following, which was adopted:

Constitution and By-Laws of the American Boiler Manufacturers' Association. Adopted at Pittsburgh, April 16, 1889.

For the purpose of affording means of ready consultation, and of united, intelligent and effective action on matters of mutual interest, the undersigned, American Boiler Manufacturers, hereby associate themselves together and agree to be bound and governed by the following constitution and by-laws:

CONSTITUTION.

ARTICLE I.

Name.—The name of the association shall be the American Boiler Manufacturers' Association.

ARTICLE II.

Its objects are

1st. To establish such standard for materials and workmanship as will insure uniform excellence of construction of all American boilers, and thus secure safety to the lives and property of all communities where boilers are used, and to procure the passage of laws making the manufacture, sale or use of inferior materials criminal offenses.

2d. To concert such measures and take such action as shall be for the interest and advantage of its members, especially,

3d. To procure and furnish to its members statistics of the trade, domestic and foreign, and

4th. To take such action as shall from time to time be deemed advisable regarding the regulation of prices and production.

ARTICLE III.

Membership.—Any firm, corporation or individual manufacturing boilers who shall take part in the adoption of this constitution shall hereby become a member of this association, and thereafter any such manufacturer may become a member upon application to his State Committee in writing, agreeing to be bound by this constitution and paying the initiation fee.

ARTICLE IV.

Officers.—The officers of this association shall be a president, three vice-presidents, a secretary and a treasurer. These officers shall together constitute an executive committee. The duties of said officers shall be such as usually appertain to their offices, and such as shall be set forth, stated and fixed by the by-laws of this association, or such as may from time to time be imposed upon them by the association.

ARTICLE V.

Assessments.—The expenses of this association shall be met by initiation fees and by assessments levied from time to time, as regulated by the by-laws.

ARTICLE VI.

State Committees.—Each State in which at least three members of this association are located and in which they employ not less than one hundred (100) boiler-makers shall be entitled to a State Committee of not less than three nor more than five members, who will organize by electing from their number a chairman and a secretary, who shall at once notify the president of the association of such action. Members in such States where there are no State Committees may attach themselves to the nearest State Committee.

ARTICLE VII.

All questions affecting the boiler trade or connected with the welfare of this association shall be submitted to the vote of the association by letter ballot through the State Committees by the president on resolution of the Executive Committee. It shall further be the duty of the president to submit such matters in the same manner on the written request of any five members of the association.

ARTICLE VIII.

Amendments.—Any changes in our amendment to this constitution may be made at any regular meeting of the association, provided at least one month's notice has previously been given by circular to the members—absent members voting by letter ballot, or by letter ballot after like notice, the ballots being canvassed by a majority of the Executive Committee. A two-thirds vote of the whole association shall be necessary to carry any such change or amendment.

BY-LAWS.

Section 1. The officers of the association, after those elected at the time of organization, shall

be elected by ballot at the regular meeting, to be held on the first Tuesday in February of each year, and shall hold their respective offices for one year, or until their successors are elected and are ready to enter upon the duties of their respective offices.

Sec. 2. The president shall preside at all meetings of the association, shall be entitled to vote on all questions coming before the association, and shall perform all other duties incident to the office of president.

Sec. 3. The vice-presidents in the order of their election shall, in the absence of the president, perform the duties of the president, and in the absence of the president and vice-presidents a president *pro tem*, shall be elected from the members of the association present.

Sec. 4. The secretary shall have charge of all papers and a memoranda belonging to the association, keep a correct method of all its proceedings and act as secretary of the Executive Committee. He shall also communicate to all members of the association, through the State Committee, such action and information relative to meetings, reports, statistics, &c., or other matters affecting the common interest as he shall be in possession of. He shall also perform such special duties as may be assigned to him by the association, the president or the Executive Committee. The salary of the secretary shall be \$3000 per annum, payable monthly; he shall also be paid his expenses when traveling on the business of the association.

Sec. 5. The treasurer shall receive and have charge of all moneys of the association, shall keep a correct account of the receipts and expenses and shall present a detailed statement of the same, with the proper vouchers therefor, annually at the meeting in February and whenever called upon by the association. The treasurer will pay out money only to the order of the president countersigned by the secretary. The treasurer is to give a bond of \$5000 for the faithful performance of his duties.

Sec. 6. The initiation fee is to be \$25. The Executive Committee may fix assessments from time to time, not exceeding \$20 in any one year.

Sec. 7. The Executive Committee in the intervals between the meetings of the association shall have the authority to take such action as they may determine upon in furtherance of the general objects, reporting such action to the next meeting of the association, or by circular through the State Committees. They shall also perform such duties as may from time to time be imposed upon them by the association.

Sec. 8. Any vacancy in any office, however occurring, shall be filled by the Executive Committee at their next meeting after the vacancy shall have occurred.

Sec. 9. The meetings of this association shall be held in various parts of the country; the point for each annual meeting to be chosen at the preceding meeting.

Sec. 10. These by-laws may be altered or amended by a simple majority of those voting by letter ballot on one month's previous notice by circular.

Philip Rohan moved that the secretary, or some other person appointed by him and other members of the Executive Committee, receive \$1000 and all expenses while traveling for the period of six months, that all those desiring to join the organization might have an opportunity of knowing its purpose.

Motions to furnish all boiler manufacturers with a report of this convention, that a certificate of membership be given to those joining the association, that the next meeting be held in Pittsburgh, October 15, 1889, that the invitations of Carnegie, Phipps & Co., Park Bro. & Co. and National Tube Works be accepted, were adopted in quick succession.

Just before adjourning Col. E. D. Meier, of St. Louis, Mo., presented the following resolutions, which were unanimously adopted:

Whereas, Thorough uniformity in the construction of boilers can only be attained by a careful consideration of all the elements which together make up the sum of perfect materials and workmanship; and

Whereas, In these important matters the individual knowledge and experience of all members of the A. B. M. A. should be collected, arranged and compared before intelligent discussion and conclusions become possible; therefore, be it

Resolved, That the president shall at each regular meeting appoint committees of from three to five members each, well distributed territorially, whose duties shall be to collect and tabulate these data in the form of reports, to be submitted for discussion at the meeting next following; and that he shall also appoint

such committees in the interim between regular meetings when requested by at least five members to do so, provided, however, that such committees are to have at least three months' time to complete their work; and provided, further, that no standards shall be adopted unless agreed to by a two-thirds vote of the whole association. Every such committee, as soon as organized, shall prepare a circular calculated to draw out from all members their best thought on the subject in hand, which is to be transmitted through the secretary of the association to each member in the manner prescribed by the by-laws, such circular to state the latest date on which replies may be made, and that the committees may, if they see fit, send such circulars also to others versed in these matters; and be it further

Resolved, That the president appoint the following committees:

1. On proper specifications for materials and tests of same.
2. On proper rules for riveting and calking.
3. On proper dimensions and construction of manheads and manholes.
4. On braces and stays.
5. On methods of attachment of valves, gauges and fittings.
6. On safety valves.
7. On uniformity in State boiler inspection laws.

Mr. J. C. McNeil, of Akron, Ohio, moved that a committee be appointed to investigate the tube question.

H. R. Barnhurst, of Erie, moved that a committee be appointed to decide the number of square feet per horse-power.

Among the prominent people present from a distance were I. P. Morris & Co., H. J. Hartley, Philadelphia; Philip Rohan, St. Louis; George Marshall, Dayton, Ohio; Christopher Cunningham, Brooklyn; R. Hammond, Buffalo; J. R. Brownell, Dayton; Col. E. D. Meier, St. Louis; James Barnhill, Bellaire; Novelty Steam Boiler Works, Brooklyn; Heine Safety Boiler Company, St. Louis; James T. Dougherty, Dayton; J. L. Shanks & Co., Salem, Ohio; James F. Wangler, St. Louis; Charles Miller, Beaver Falls; Struthers, Wells & Co., Warren, Pa.; Alonzo L. Cady, Steubenville; Lovegrove & Co., Philadelphia; Wilfong Brothers, Philadelphia; Stearns Mfg. Company, Erie, Pa.; A. R. Barnhurst, Erie; J. C. McNeil & Co., Akron; Farrar & Trefts, Buffalo; John H. Collins, Amsterdam, N. Y.; Tippet & Wood, Phillipsburg, N. J.; G. N. Barnes, Corry, Pa.; Thomas S. Driscoll & Co., Columbus, Ohio; Corry City Iron Works, Corry; Booger Brothers & Co., Columbus; Cleveland Steam Boiler Works, Cleveland; Wm. T. Bate & Son, Conshohocken, Pa.; Cox & Morrison, Wheeling; H. Holdane, Reeves Bros., Niles, Ohio; Charles Heinz, Dayton, Ohio; D. Conley, Cleveland; John Over, Philadelphia; J. P. Jefferson, Warren, Pa.; R. G. Morrison, Sharon; Richard Garstang, St. Louis.

Firms who were unable to be represented, but who have signified by letter their intentions of becoming members, are:

Bartlett, Hayward & Co., Baltimore; Excelsior Iron Works, Chicago; Daniel Kelly, Philadelphia; Geo. E. Tift, Sons & Co., Buffalo; Summit City Boiler Works, Akron, Ohio; Ames Iron Works, New York; Erie City Iron Works, Erie; Jas. Russell & Sons, South Boston, Mass.; Buckeye Engine Company, Salem, Ohio; Henry Worden, Philadelphia; Best Steam Engine and Boiler Works, Lancaster; Porter, Jackson & Co., South Chicago; A. J. Brown, Paterson, N. J.; Hugh Leslie, Jersey City; Geo. Strecker & Co., Marietta, Ohio; Alliance Steam Boiler Works, Alliance, Ohio; Cox & Sons, Bridgeton, N. J.; Frick Company, Waynesboro, Pa.; L. J. Lyons & Co., Newark, N. J.; Middleport Boiler Works, Middleport, Ohio; Gorman & Pettit, Alexandria, Va.; Connery Boiler Company, West Philadelphia; Johnston Bros., Ferrysburg, Mich.; Porter Manufacturing Company, Syracuse, N. Y.; South Bend Boiler Works, South Bend, Ind.; The Bigelow Company, New York City; National Water

Tube Boiler Company, New Brunswick, N. J.; A. B. Farquahr & Co., York, Pa.; The Globe Iron Works Company, Cleveland; Tudor Boiler Manufacturing Company, Cincinnati; Reeves Bros., Niles, Ohio; Armstrong Bros., Springfield, Ohio; Taylor Manufacturing Company, Chambersburg, Pa.

The following are the committees appointed:

Committee on Materials and Tests: E. D. Meier, St. Louis; Richard Hammond, Buffalo; H. J. Hartley, Philadelphia; J. R. Brownell, Dayton, Ohio.

Committee on Proper Rules for Riveting and Calking: Robt. M. Connery, Philadel-

Committee on Uniformity in State Inspection Laws: Geo. Marshall, Dayton, Ohio; Thos. G. Lovegrove, Philadelphia, Pa.; Christopher Cunningham, Brooklyn, N. Y.; G. N. Barnes, Corry, Pa.; Philip Rohan, St. Louis, Mo.

Sectional Boiler.

The steam generator of which we here-with present an engraving taken from our contemporary *Engineering* is the invention of Charles Ward, of Charleston, W. Va. It consists of 12 vertical pipes arranged in a straight line, six at each side

N. From these it proceeds into the drum L, where the steam is separated by a number of perforated diaphragms on its way to the pipe J. The water descends through the drum and repeats the circuit. The semicircular tubes are connected to the vertical pipes by right and left hand steel bushings, as shown by the detail view. The following are the particulars of this boiler:

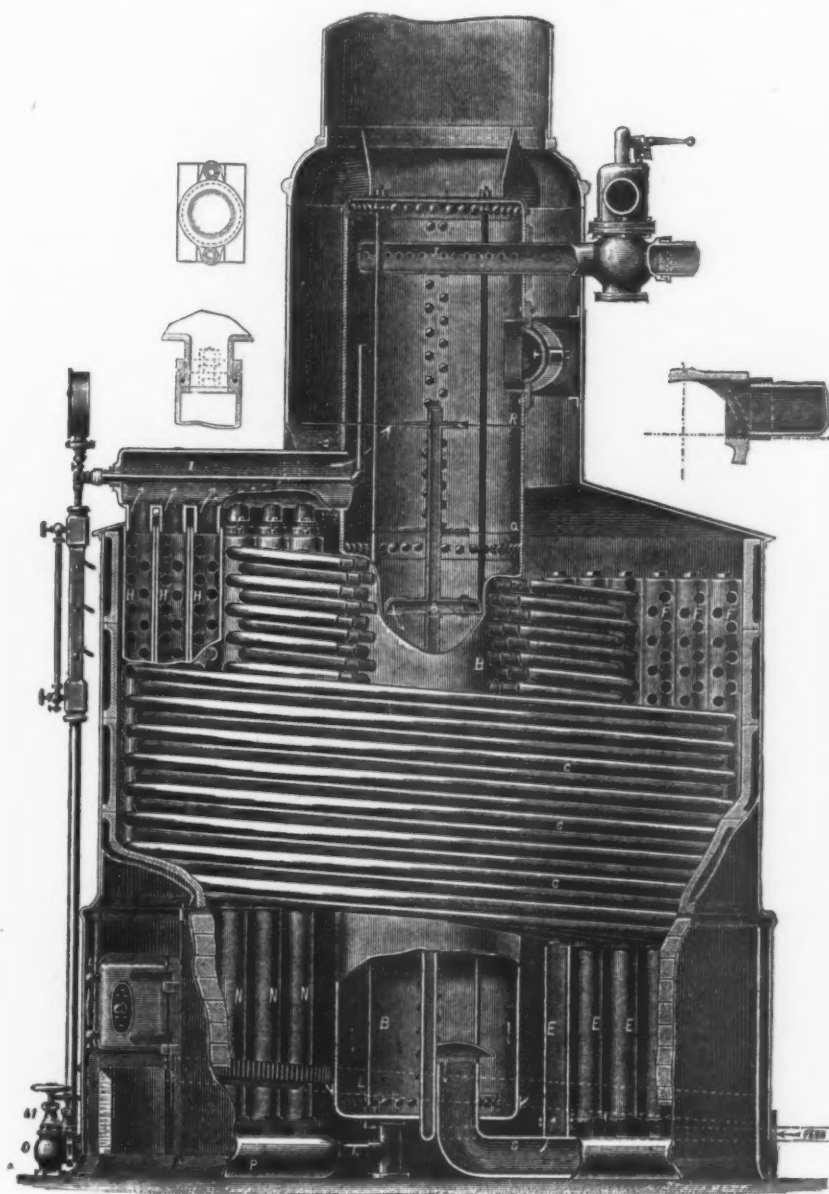
Heating surface.....	1311 square feet.
Grate area.....	42 "
Number of tubes.....	288
Outside diameter of fire-box..	8 feet 7 inches.
Height of casing.....	7 " 3 "
Diameter of drum.....	2 " 4 "
Height.....	10 " 6 "
Total weight of boiler.....	8 tons.

This boiler is made in 15 sizes, varying from 660 square feet of heating surface to 2432 square feet.

Building and Loan Associations.

Building and loan associations had their origin in Philadelphia, where the earliest one was organized in January, 1831. The majority of those formed at first were unincorporated. A few of them were organized under special acts. A general act authorizing their incorporation was passed in 1850. At first the number of shares was limited, but in 1874 this limit was removed, with the proviso that the aggregate capital of an association should not exceed \$1,000,000. It was estimated by the Secretary of Internal Affairs of Pennsylvania in 1879-80 that the associations in Philadelphia had been the means of making 80,000 people owners of real estate. The number of associations in Pennsylvania at present is estimated at 900, the aggregate capital at \$65,000,000, and the total savings paid into the associations in a year at over \$17,000,000. In New York associations were formed as early as 1849, and a general act authorizing their incorporation was passed in 1851. The first ventures in New York City were unfortunate, and the system died out there after a few years, not to reappear until 1885, since which time there has been a marked revival. A general act providing for their incorporation was passed in 1887. The system has extended to other States, among them being Massachusetts, Ohio, Illinois, Wisconsin, Michigan, Minnesota, Indiana, Iowa, Kansas, Missouri, California, Louisiana and Texas. The total number of these associations in the United States is estimated by Seymour Dexter, in an article published in the *Quarterly Journal of Economics*, at about 4000, the accumulations held by them at about \$300,000,000, and the amount which will be paid in the form of dues during the current year at about \$65,000,000. Touching the economic advantages of these associations, Mr. Dexter says that as an institution for savings no scheme has yet been devised and put into operation which combines safety of the funds, cheapness in management and good rates of interest in so great a degree. Further, he says that these associations can be conducted successfully in any business center having a population of 500, and thereby the benefits of an institution for savings can be secured by the many villages that have not sufficient population to maintain a savings bank, while as a means for stimulating savings such associations are more potent than savings banks themselves, owing to the fact that while a man is a member he is compelled to deposit a certain amount at fixed periods, while he is at liberty to withhold his deposits from the savings banks.

Only a few heats were made on the Bildt process at the Troy Works, nor was the steel produced carried as low as it is possible to go, the carbon contents of the steel ranging between 0.06 and 0.09 per cent.



WARD'S SECTIONAL BOILER.

phia; John MacCormack, Albany; J. Mathews, South Bend, Ind.

Committee on Manheads and Manholes: Jos. F. Wangler, St. Louis; A. Wilfong, Philadelphia; J. S. Shanks, Salem, Ohio; Luther Allen, Cleveland, Ohio; R. Munroe, Pittsburgh, Pa.

Committee on Bracing and Stays and Proper Tube Spacing: J. C. McNeil, Akron, Ohio; J. P. Jefferson, Warren, Pa.; Henry Warden, Philadelphia.

Committee on Attachment of Valves and Fittings: Richard Garstang, St. Louis; Thos. S. Driscoll, Columbus, Ohio; Geo. S. Barnum, New Haven, Conn.

Committee on Safety Valves and Horsepower: H. R. Barnhurst, Erie, Pa.; Chas. F. Foster, St. Louis, Mo.; J. W. Wood, Phillipsburg, N. J.; John Trefts, Buffalo, N. Y.

of a central drum. Each pair of vertical pipes is joined by 48 slightly inclined tubes, each forming nearly a semicircle. There are, therefore, six concentric sections of tubes, two only of which are shown in the illustration. The vertical pipes are joined to large horizontal pipes at the lower ends, and one set of them is connected at the upper end to a horizontal pipe in communication with the central drum. The following is the mode of operation: The feed water is introduced to the central drum by a pipe ending in rose A; it descends slowly, becoming heated in its passage, and deposits its mud at the bottom of the drum. It then enters the horizontal pipe G (called by the inventor a "manifold") and rises up the vertical pipes E until it can escape through the curved tubes G G into the vertical pipes

The Western Wages Scale.

In a little more than a month the wages scale question will come up before the Western iron manufacturers and the Amalgamated Association of Iron and Steel Workers. The scale now in force pays \$5.50 per ton for boiling on a 2-cent card, and will expire on June 30 next. Considerable interest is already being manifested concerning the question whether the manufacturers will act on their individual responsibility or whether they will appoint a conference committee, as they did last year. Then the manufacturers had an association known as the Association of Manufacturers of Iron, Steel and Nails, the sole object of which was to deal with labor and wages questions. The members composing this organization prepared a scale last year based on \$5 per ton for puddling on a 2-cent card, and it was given out that every member had pledged his word to stand out for the enforcement of this scale. When July came several of the manufacturers at once signed the Amalgamated scale and proceeded to start up their mills. This action caused considerable ill feeling, and charges of bad faith were made, with the result that the manufacturers' organization was broken up and a number of its former members stated that in the future they would act on their own responsibility in settling wages questions. Up to the present time no attempt has been made to reorganize this association, and from present appearances the conference committee of the Amalgamated Association will have to present their scale to the manufacturers individually this year. While it is true there is plenty of time remaining for the manufacturers to organize, it is also true that there are a number who will refuse to join any organization that may be formed. It is the impression that the lack of organization will very materially weaken the position of the manufacturers and give the workmen a decided advantage if a conflict should take place. While nothing definite can be said at this time as to what demands will be made by the parties interested, it is believed that the workmen will present practically the scale now in force, while hints have come from certain quarters that the manufacturers will demand a very material reduction. The question has already been brought up of closing down the mills during the months of July and August, and is being agitated principally by the workmen, who state that a complete shut-down for those months would allow the manufacturers to reduce their stocks and also give the workmen a much-needed rest. Some of the manufacturers view this proposition with favor, while others state that they will not agree to it, for the reason that they would be in danger of losing their trade. It is a well-known fact that there are certain concerns in the West so situated that it is an impossibility for them to close down their plants for a length of time, and these concerns are always among the first to sign the scale rather than submit to a shut-down. The developments of the next few weeks will no doubt throw considerable light on this important question.

Basic Steel for Horseshoe Nails.

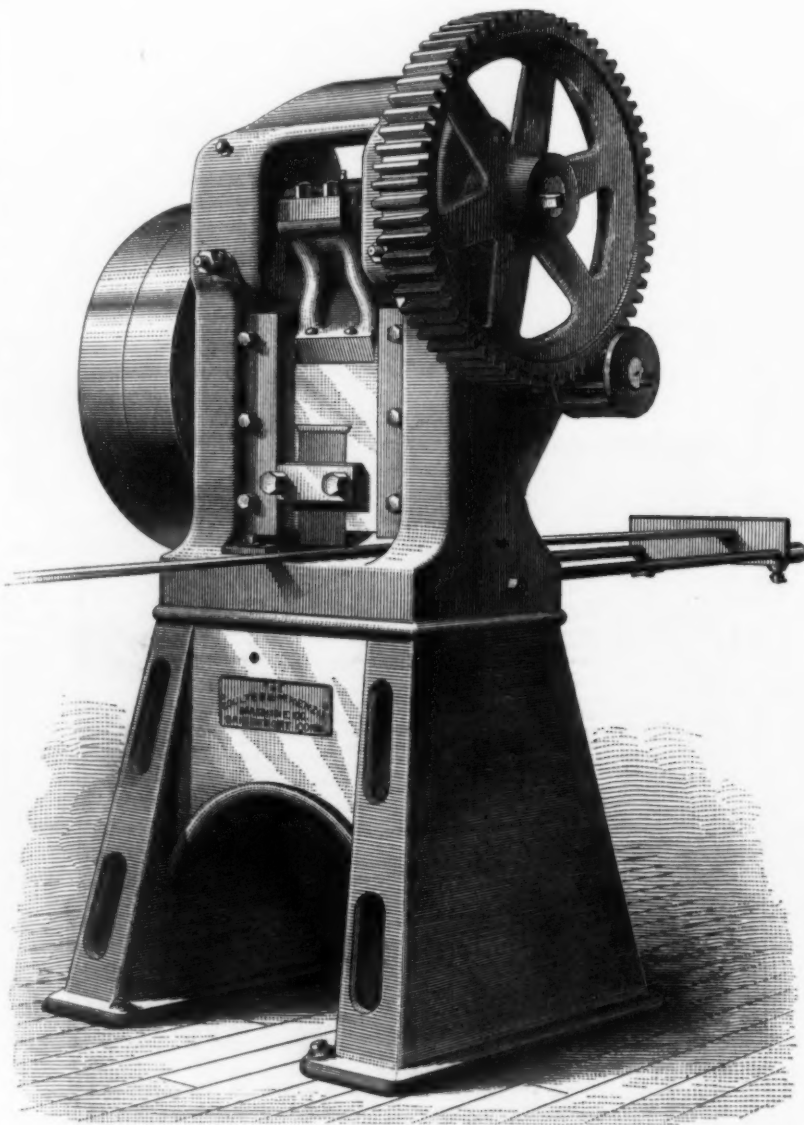
—Some time since Moeller, one of the leading horseshoe nail manufacturers of Germany, declared that after a thorough test his firm, Moeller & Schreiber, of Eberswalde, had reached the conclusion that the only trustworthy material is Swedish iron. Without being discouraged by an earlier failure the Peiner Walzwerke, of Peine, Germany, undertook recently to meet the requirements. They sent a lot of basic steel to the Government testing establishment at Charlottenburg, where

elaborate tests were made. From a detailed report made by Dr. Wedding it appears that the material proved fully the equal of the Swedish iron. We believe that in this country mild steel has also been used with some success in manufacturing horseshoe nails.

New Shear Press.

The accompanying engraving shows a new and recently-designed shear press which has just been put on the market by the Coulter & McKenzie Machine Company, of Bridgeport, Conn. One of the

and ratified by the United States Government last year after some hesitation. That treaty provides that the subjects or citizens of each of the contracting Governments shall enjoy in all the other countries parties to the convention the same advantages that the respective laws thereof accord to their subjects or citizens so far as concerns patents for inventions, trade and commercial marks and the commercial name. One of the features peculiar to the American patent system, which does not seem to have been closely considered in framing the treaty, gives to citizens of the United States and aliens who have resided for one



SHEAR PRESS, BUILT BY COULTER & MCKENZIE.

main features of the press is the loose pulley, which is the same size as the balance-wheel, and the use of which dispenses with the separate counter-shaft. The knives are made extra strong, and can be used with more economy than formerly. The cuts being long makes large wearing surfaces. The connection is all in one piece, with bearings of unusual length, and the whole machine is strong and solid. It will be observed that this machine requires no expensive foundation. This press was designed expressly for the Spring Perch Company, of Bridgeport, for clipping the ends of steel plates. The same pattern is also used for heavy punching. It weighs 3700 pounds.

An interesting question arose recently regarding the effect of the international convention for the protection of industrial property, proclaimed at Berne in July, 1887,

year in the country and have made oath of their intention to become citizens, the privilege of filing caveats for uncompleted inventions. A citizen of Switzerland, relying on the provision in the treaty above mentioned, lately presented a caveat for an incomplete invention, asking that it be placed in the secret archives of the Patent Office, as provided in the case of citizens. The Patent Office declared that it had no power to receive the caveat under existing laws, holding that while the terms of the convention might be construed to extend the right claimed to the subjects of the signatory Governments, it could only be done after action by the legislative power. This decision of the Patent Office has just been sustained after examination by the opinion of the Attorney-General, who holds that the treaty is not self-executing, but requires legislation to render it effective for the modification of existing laws.

THE WEEK.

New Haven will expend \$500,000 on the construction of a water reservoir at Woodbridge, on the West Haven River, 6 miles from the city.

The Cunard steamer Umbria made her last trip from New York in 6 days 2 hours and 25 minutes. Three months ago she made about the same time.

Some of the latest-built gunboats, like the French torpedo-boats, are provided with armaments disproportioned to their tonnage, and fears are expressed that some of the American boats after the same model may be equally at fault. Recent reports of the maneuvers of the British naval fleet show that the six vessels of the Archer type pitched and rolled about to such an extent in a moderately heavy sea that the guns were so unstable that they could not be directed with any approach to accuracy of fire. The significance of this report to naval officers here lies in the fact that the new gunboat Yorktown is patterned after the Archer and will carry the same caliber and weight of ordnance. Failure has also attended the efforts of the British constructors to build a 20-knot ship, of which the Navy Department at Washington is attempting to build two under the direction of act of Congress. The Medea, which was built for a 20-knot ship, has never exceeded 19 knots. Other vessels of the same type have failed to develop anything like 9000 horse-power.

Retaliation on the part of Canada may be expected should it prove true that Canadian freight cars coming into the United States and running over United States railroads will now have to pay the regular rate of duty at points of entry. The Treasury Department, it is reported, has had the matter under consideration for some time—in fact, ever since the fisheries trouble. An account kept at some points of entry shows that an average of 300 such cars come in daily at Detroit and Port Huron, Mich., and at Niagara Falls, and that fully 3000 dutiable Canadian cars are in constant use on roads in the United States.

One of the gunners on board the United States warship Trenton, before she was dashed on the reef at Samoa, describes the fury of the tempest. He says: "We were steaming at the rate of 10 knots and had five heavy anchors down. All the vessels had all their masts and yards down, and were making a heroic struggle for existence. The ship seemed fairly to leap out of the water. At times the bows would be lifted entirely out of the water so you could see half their keel."

The total shipping tonnage on the American lakes is shown by the registry of the marine underwriters to have a value of \$43,522,700, exclusive of new craft on the stocks and coming out this season. The vessels are classified as follows:

Class.	Number.	Tonnage.	Value.
Tugs.....	418	11,369	\$2,194,400
Propellers.....	548	361,929	31,124,300
Side-wheel steamers.....	37	14,649	1,738,000
Schooners.....	572	157,890	4,988,000
Lake barges.....	301	129,043	3,414,000
St. Lawrence River barges.....	2	336	4,000
Totals.....	1,878	675,497	\$43,522,700

Including new additions and vessels which have no ratings, the total value is believed to be nearly \$50,000,000.

The difficulties between England and Venezuela being no nearer a settlement than ever, the Venezuelan consul in New York departs from the usual forms of diplomacy by making a public statement in which he says: "England has taken advantage of her superior forces to seize Point Barima, over which Venezuela has always held undisputed sway. The pos-

session of Point Barima implies the entire control of the mouth of the Orinoco, consequently of the whole river, and the river forms, with the Amazon and the Plata, the prodigious fluvial net of South America, connecting with each other through all its different branches some well-known rivers and others yet unexplored. Thus the ruler of the Orinoco can travel to Colombia by the Meta, to Peru and Bolivia by the Ucayale, to Ecuador by the Mapo and the Branco, to Brazil by the Rio Negro, Marañon and Branco; to Paraguay and Montevideo by the affluents of Marañon, and all that is lacking is a communication for a distance of about 12,000 yards in order to communicate with Buenos Ayres."

The Florida land investments of the Disston saw manufacturers are resulting in an important addition to the productive sugar regions of the South. A new factory opened at Kissimmee this season is said to have turned out 1,500,000 pounds of sugar from 8800 tons of cane, a yield exceeded by only three of the thousand sugar factories of Louisiana. A New Orleans paper says: "There is no telling what the extension of the Florida sugar interest may be, now that machinery is reclaiming the rich sugar lands of that State. Texas claims to have 400,000 acres of fine sugar lands in the lower part of the Brazos Valley, and is rapidly developing the industry in that region, where a central factory is claimed to have made last year a larger crop than that manufactured from any single estate in Louisiana. The capacity of Florida for sugar production is yet unknown, though it may equal that of Louisiana."

The Beet Sugar Company has been incorporated in San Francisco, with a capital of \$5,000,000, the Spreckels holding half of the stock. The object is to erect large sugar refineries at various points on the coast, in addition to one already established at Watsonville, Cal., in the expectation of refining 50,000 or 60,000 tons of sugar a year.

The cost of the Paris Exposition this year is expected to be \$10,000,000, of which fully one-half will be borne by the Government.

The lamentable death of Postmaster Henry G. Pearson, after many years of unswerving fidelity in public service, leaves the position vacant until May 1, at which time the postmaster-elect, Cornelius Van Cott, will enter upon his duties. Meanwhile, ex-Postmaster-General James is acting postmaster at New York.

Liverpool, England, is to have an elevated railway on the line of the docks, about \$2,000,000 having been promptly subscribed for this purpose. It is safe to predict that New York City will eventually be provided for in like manner, so that pedestrians and vehicles will no longer be intermingled at the various ferry landings on the same level.

The New York Nautical Schoolship St. Mary's has received about 90 applicants for instruction in practical seamanship and will soon have her full complement of 125. The Philadelphia Schoolship Saratoga is being similarly organized.

The American adviser to the Korean King, O. N. Denny, is reported to have resigned his position, and, according to a telegram from Seoul received in Yokohama, the consideration was \$30,000, received from Li Hung Chang, representing the Chinese Government, to whom Judge Denny's presence has been an offense.

The Board of Bureau Officers which has been considering the proposals received for building the armored coast-defense vessel has completed its work and reported to the Secretary of the Navy. It is understood that the board finds that it

is not possible to build the vessel under the lowest bid (\$1,614,000) and comply with the terms of the act of Congress, which fixes the total cost of the naval rams, batteries and other naval structures to be built under its authorization at \$2,000,000. Out of this total must come the armor for the coast-defense vessel, which is not to be furnished by the contractor, and which will cost \$350,000, anchors, boats, &c., and the submarine boat for which proposals were received some months ago.

The Boston Navy Yard has been practically idle for several years on account of the lack of Government work and because the great bulk of construction has been given to private firms. Boston realizes the advantages to be obtained by having built at that yard one of the new big cruisers to be begun during the summer, and efforts will be made to have it assigned there.

Oil lands in Ohio comprising 25,000 acres have been purchased by the Standard Oil Company, and besides extending a pipe line to the Pennsylvania oil fields they are making extensive improvements, with the object, it is said, of refining Lima oil and sending it out in tank cars to distributing centers. It is denied that there is any intention of abandoning Pennsylvania, as reported.

The Illinois House has passed the bill providing for widening and deepening the Illinois and Michigan Canal to the dimensions of a ship canal from Chicago to its connection with the Illinois River, and the improvement of the latter to a corresponding degree to its connection with the Mississippi River. This enterprise, which so long has occupied the attention of Congress, is now looking in the right direction for patronage—to the State Legislature rather than to the general Government.

The Mayor of Baltimore says that city is growing faster than any other in the country, unless some of the mushroom towns in the West are excepted, and that the population numbers 500,000.

The bar at Atlantic City has been made impassible by recent storms.

Mayor Grant hastens to clear the streets of electric wires, availing himself of the authority conferred by law, as recently decided in the courts. The companies affected are now most concerned to save their property from seizure and find it necessary to move with speed. The streets from which poles have been removed appear to be much wider than before.

Shipments of arms from New York to Hayti continue.

The Lake Shore and Michigan Southern Company have ordered 25 new engines from the Schenectady Locomotive Works. Three of the number are heavy passenger engines, 15 Mogul freight engines, and the others are designed for switching purposes.

The failure of the Callender Insulating and Waterproofing Company, whose factory is at Harrison, N. J., involves several New York firms to some extent, but what percentage of loss will be shown in the settlement with creditors cannot be known at present. The plant is said to be mortgaged for \$100,000. Among the creditors Fuller Bros. are mentioned and others whose amounts are not so large.

Australian advices respecting the partial failure of the wheat crop indicate a total deficiency in New South Wales, Queensland and Tasmania of 8,750,000 bushels, while Victoria, South Australia and New Zealand have an available surplus of 9,500,000 bushels, or 75,000 bushels more than the deficiency of the other three

colonies. Considerable engagements have already been made for further shipments to Europe from New Zealand, Victoria and South Australia.

One of the most destructive fires in New York for many years occurred on Friday night, when all of the docks and buildings on the North River water front from 58th street to 70th street, together with freight-houses and two grain elevators belonging to the New York Central Railroad Company, were totally destroyed. The loss will amount to at least \$3,000,000.

The exportation of live cattle from New York has suddenly grown to large proportions, demanding all the available room on the outgoing freight steamers. The aggregate shipments from New York, Boston and Baltimore last week comprised 14,200 head, the largest in the history of the trade. Beef is much cheaper here and in better condition than usual, owing to the abundance of corn.

The Canadian Government has published a record of changes in transportation effected by the construction of the Intercolonial and Canadian Pacific railroads. According to this report, the traffic handled by United States lines for Canada (in intercolonial trade and foreign commerce) has declined to one-half the amount carried the year before the Intercolonial road was opened. In 1875 the railroad lines of the United States carried \$46,000,000 of Canadian merchandise between points in the Dominion and between Canada and our seaports. In 1888 this traffic dwindled to \$23,000,000.

The pernicious operation of the Yates prison bill becomes more evident every day in the experience of New York State. This year there is already a deficit of \$192,388.97 for the past six months, and there are more convicts confined than ever before, with the number increasing, due to the fact that the county judges, instead of sending prisoners to the penitentiaries, as they are no longer self-supporting, prefer to confine them in the prisons as a burden to the State. Within the past six months 37 convicts have been locked up in the Auburn Insane Asylum, an increase of 27 over the number for the same time last year.

Emigration to the United States has commenced in earnest this spring at various European ports. Four thousand, mainly Germans and Swedes, sailed from Liverpool in a single day. The movement is said to be more voluntary in character and less the work of agents than hitherto. The increase is due to the pressure of military duty and taxation.

The alleged electric sugar frauds hang fire in the courts. Ever since Mrs. Olive E. Friend was arrested as being one she has been confined in the Tombs, as she has been unable to procure a bondsman for \$7000. She still maintains that her husband really possessed the secret of refining raw sugar cheaply and quickly by means of electricity. Assistant District Attorney Davis, who is in charge of the case, has not as yet been able to prepare for trial, but he is very positive that the whole scheme was a swindle.

The Edgemoor Iron Company have taken the contract for an iron bridge across the Delaware, at Portland, Pa., to perfect the connection with the Poughkeepsie Bridge.

Port improvements at Buenos Ayres are so far advanced that steamships are no longer compelled to anchor far from the shore and lighter their cargoes to the city. The first section or basin was formally opened January 28. United States Consul Baker says there are three other basins of equal size with the one just opened in process of construction, connected by gates and with deep canals on each side,

all of them approached from the outer roads though the outer channels of the Riachuelo, and within two years it is expected that the entire port will be open to commerce.

The Interstate Commerce Commission decides that a rebate allowed by the Grand Trunk Railway of Canada in transporting coal and coke from Buffalo and other points in the United States to various points in Canada is illegal. The question at issue arose between the Michigan Central and the Grand Trunk, especially in regard to the movement of anthracite coal to various points in Canada. Both make large shipments into Canada. The latter company have seen fit, according to the statement of General Manager Hickson, "to make special rates to the principal points for large shipments." As the Michigan Central are not permitted by the Interstate act to do the same thing, and competition under such circumstances is disadvantageous to that company, they have appealed to the commission and have had a hearing, with the result mentioned above.

Further particulars respecting the loss of the steamship Danmark, obtained from her engineers, show that the disaster is primarily due to the bursting of a steam-pipe, or a breaking down of the engines, when the steamer was within 800 miles of the coast of Newfoundland. The engineer was killed on the spot and the ship was badly damaged. In consequence of this damage, together with the breaking of the shaft, the vessel was helpless in the heavy seas, making it necessary to abandon her. The steamship Missouri rescued the passengers and towed the Danmark two days, until April 6, when it was decided to leave the wreck and sail direct to the Azores.

Mrs. Maria St. John Sheffield, widow of Joseph Earl Sheffield, donor of the Sheffield Scientific School at New Haven, died in that city on Sunday night. In 1860 Mr. Sheffield gave to the scientific department of Yale the building now called South Sheffield Hall. By Mr. Sheffield's will the "homestead" was to go to the college after the death of Mrs. Sheffield. This property is now valued at \$250,000. Property on Chapel street, in which the school has an interest, will increase the amount to nearly \$600,000.

The value of the fisheries of Canada, which have been so much a subject of international dispute, decreased nearly \$1,000,000 during the year 1888, as shown by the official report, as follows:

Nova Scotia.....	\$7,817,030
New Brunswick.....	2,941,863
British Columbia.....	1,902,195
Quebec.....	1,860,012
Ontario.....	1,839,469
Prince Edward Island.....	876,862
Manitoba and Northwest Territories.....	180,677

Showing an aggregate of..... \$17,418,510
As against \$18,386,103 for the year 1887,
or a decrease of \$967,592.

At the first general meeting of the subscribers to the Meigs Elevated Railway, held recently, the charter of the corporation was approved and it was decided to issue stock to the amount of \$200,000. From this it would appear that this scheme, which has languished long and which really embodies new methods of elevated railroad construction and operation, is about to assume a more tangible form.

An acid trust was organized at Middletown, N. Y., lately by 35 leading manufacturing concerns, with John Bayless as president. Pyroligneous acid and charcoal are the first products of the distillation of wood confined in sealed iron retorts and subjected to intense heat. The acid when subjected to a further process yields what are known as the wood alcohol, acetate of lime and naphtha of commerce. The

alcohol is the most valuable product, inasmuch as it affords a cheap substitute for grain or fruit alcohol in the arts and for mechanical and manufacturing uses. There are 60 acid factories in the wooded region comprised within the bounds of Sullivan, Delaware and Broome counties, New York, and Wayne and Susquehanna counties, Pennsylvania, and perhaps a dozen others in West Virginia, Kentucky and Tennessee. The value of the total annual output of the factories is estimated at \$2,500,000.

The Ericsson Coast Defense Company have filed their certificate of incorporation. The company's capital is \$250,000 and their object the manufacture and sale of boats, vessels, guns, machinery and other appliances. The incorporators are George H. Robinson, William Williams, Ericsson F. Bushnell, Cornelius S. Bushnell and Edward S. Innet.

Findlay, Ohio, and Tiffin also, on the natural gas belt, are astonished by the copious flow of gas from newly-drilled wells. A well struck last week is said to have a capacity of 30,000,000 and another 20,000,000 cubic feet of gas per day. At Tiffin the pressure of an old well increased suddenly, blowing out the casings of the well and bursting pipes in a factory which used the gas. This well has an estimated capacity of 28,000,000 feet per day.

According to the *Ironmonger* the three great telephone companies of England have, after protracted negotiations, agreed to amalgamate, subject to confirmation on the part of the shareholders. The total value of their properties is close upon 4,000,000 sterling, and the present total revenue £400,000. The amalgamated companies intend running telephone wires between all the great towns in England.

The *Leader*, of Pittsburgh, reports as follows respecting an experiment in copper welding recently made in that city: "James Burns, representing the Burns Copper Welding Company, took possession of an ordinary blacksmith forge, and with a rod of copper $\frac{1}{4}$ inch in thickness began operations. After the flattening process usual in such work he formed a disconnected ring. The usual 'scarfing' process followed, then the operator, after sprinkling a powder over the piece, proceeded to make a weld which when cooled showed a perfect union. He then took the ring, measuring 2 inches in diameter, and submitted it to a strain until it had widened $\frac{1}{4}$ inch. This demonstrated conclusively that the union of the two ends of the rod was not the mere 'brazing' known to mechanics to-day. Other experiments were made, and in every case the spectators expressed themselves as being satisfied that the process was a complete success. Some of those who watched the work have spent years in working among metals, and consequently were well justified to express an opinion in regard to the copper-welding process."

The final arguments in the case of Andrews Bros. & Co., of Youngstown, Ohio, vs. the Youngstown Coal and Coke Company, Limited, were heard in the United States Circuit Court at Pittsburgh last week. An interesting point is involved in this suit. Three years ago the Youngstown Coal and Coke Company agreed to furnish the plaintiffs coke at the rate of 95 cents per ton. Last November the price of coke went up and defendants refused to furnish any more at the price agreed upon. They claimed that the agreement made between the firms was illegal, having been entered into by but one member of the limited firm. The law provides that two members of a limited concern be parties to an agreement. Andrews Bros. & Co. bring action in equity for a new contract, there being no legal redress on the old one.

MANUFACTURING.

Iron and Steel.

On Tuesday, the 16th inst., the employees of the Allegheny Bessemer Steel Company, of Pittsburgh, whose works are located at Duquesne, Pa., went out on a strike, and at this writing every department of the extensive plant is idle. Several weeks ago the rail straighteners, drillers and telegraphers, about 45 men in all, struck for the same wages paid at the Edgar Thomson Steel Works. They were receiving \$2.50 per day. The firm offered to increase their wages to \$4.50 per day; but they would not return to work unless the firm would consent to discharge a man who had refused to stand with them in their demand for more money. This the firm refused to do, with the result that every man employed at the works at once stopped work. The company have made application to the Governor for the appointment of 25 coal and iron police officers. The men will be assigned to duty as soon as their commissions arrive, protecting the property of the company and their men.

One hundred coke ovens are being built by the Cameron Coal and Iron Company at Emporium, Pa. The company's blast furnace at that point is turning out 100 tons of pig metal a day.

Lean & Blair, engineers and contractors, of Pittsburgh, are erecting a 2-ton Lash open-hearth steel-melting furnace for the Johnson Company, of Johnstown, Pa.

The Penn Bridge Company, of Beaver Falls, Pa., manufacturers of bridges, roofs and structural ironwork, are operating their works to their fullest capacity, with sufficient orders on hand to keep them busy for two months to come.

The threatened strike of the furnace-men in the employ of the Crane Iron Company, at Catasauqua, Pa., on account of a reduction of wages, passed over without a cessation of labor, the employees concluding to accept the reduction. In consequence the fillers commenced re-filling on Saturday, the 13th inst., and Nos. 4, 5 and 6 furnaces are casting iron as usual. No. 3 was in need of repairs and allowed to go out. No. 1 is also undergoing repairs.

The annual meeting of the stockholders of the Birmingham Rolling Mill Company was recently held at Birmingham, Ala., and resulted in the selection of the following officers: G. W. Norton, president; W. B. Caldwell, vice-president; B. Du Pont, treasurer; John B. McFerren, W. W. Hite, W. P. Harvey, and J. G. Caldwell, all of Louisville, directors. "As the fiscal year of the company does not end until June, there were no formal reports, but the condition of the industry as shown to the stockholders was more than satisfactory."

The Standard Iron Company, of Bridgeport, Ohio, are erecting a large building for the purpose of taking care of their increased corrugating business, which has so grown that they were not able to handle it in their old buildings. With the new accommodations the new company will have a capacity for painting and corrugating 50 tons of sheets per day, probably the largest capacity of any concern in this line in the country.

The Columbia Rolling Mill Company, at Jersey City, N. J., are progressing with their improvements and extension. They have just completed the erection of four reverberatory furnaces, a smelter, and the putting in of a 10-ton coal scale, and are sending out proposals for two 100 horse-power boilers, a 150 horse-power engine and the necessary machinery for running

four pairs of rolls, which when completed will greatly facilitate and increase their capacity for production.

Spearman, Collord & Co., of Sharon, Pa., who have been operating the Sharon Furnace, at that place, under lease for some months, have declined to purchase it at the option they have held on it for some time. Their present lease expires on July 1 next. The furnace is owned by Boyce, Rawle & Co., of Sharon, Pa.

The blast furnace, engines and other property of the old Duluth Iron Company were sold on the 6th inst. to satisfy a mortgage judgment of \$130,000. In 1883 Walter Mann, of St. Paul, the trustee of the property, purchased 100 \$1000 shares of stock, and when the company stopped business a mortgage and trust deed was executed to him to make good his interest in the concern. There were no bidders for the property besides Mr. Mann.

The large new plate mill recently erected by the National Tube Works Company, of McKeesport, Pa., was put in operation last week.

During the month of March last the two stacks of the Isabella Furnace Company, at Etna, Pa., produced 11,194 gross tons of foundry pig iron.

The nail factory of P. L. Kimberly & Co., Limited, at Sharon, Pa., containing 40 nail machines, is in full operation making both iron and steel nails. We are informed that the report that this firm were making a combination iron and steel nail is without foundation.

C. Burkhardt & Co., proprietors of the Falling Spring Charcoal Furnace, at Chambersburg, Pa., which has been idle for some time, have leased the furnace for one year to Burkhardt & Co., who expect to put the furnace in blast some time in July next. It will produce cold-blast charcoal iron and is expected to turn out about 15 tons per day.

Mont Alto Furnace, of the Mont Alto Iron Company, at Mont Alto, Pa., was put in blast on the 3d inst., after being thoroughly repaired and relined. It is expected to turn out about 30 tons per day of hot-blast charcoal iron.

On the afternoon of the 11th inst. the American Tube and Iron Company, of Middletown, Pa., received a cable message from Russia ordering 30,000 pounds of casing to be sent to a particular point in the Russian oil territory as soon as possible. The general superintendent of the company, Mr. A. S. Matheson, at once made preparations to fill the order at the earliest possible moment. When the cablegram was received the iron for the tubing was in the rough at the rolling mill in York, and it was at once forwarded to Middletown. The rolls that make the pipe were speedily changed, the millmen set to work with a will, and so successful were the efforts of the superintendent that the pipe was delivered at the ship's side on the night of the 12th inst., and on Saturday morning was in the vessel *en route* to Russia. The above company have also recently received an order from the Citizens' Natural Gas Company, of Lafayette, Ind., for 27 miles of 8-inch pipe, and will also furnish 20 miles of standard 8-inch pipe of superior requirements to the National Transit Company for their oil line to Cleveland, Ohio. The company have contracted under forfeit to ship these parties an aggregate of over a mile of pipe per day.

We are informed that the report that J. Morgan Coleman, of Youngstown, Ohio, had commenced the erection of a rolling mill at New Birmingham, Tex., is without foundation.

Ella Furnace, at West Middlesex, Pa., operated under lease by the Wheeler Furnace Company, of Sharon, will be blown out at an early date for extensive repairs.

The plant of the Warren Tube Company, at Warren, Ohio, which originally cost about \$150,000, was sold at sheriff's sale on Saturday, the 13th inst., to O. C. Barber, of Akron, Ohio, for \$35,000. It is reported that Mr. Barber represented the majority of the original stockholders, and the works are now practically in the hands of the builders. It is also stated that the plant will be put in operation at an early date.

Hecla Furnace, of the Hecla Iron and Mining Company, at Ironton, Ohio, is being extensively repaired and will be ready to resume blast in a few days.

About one month ago the hot-bed men, the telegraphers and furnacemen at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., received notice that they would get an increase in wages, the same to be paid by a percentage on all rails produced over 1200 a day. At that time the engineers, hot and cold saw men and water-tenders asked for a similar advance, but were refused. At the last pay the advance was voluntarily granted. The roll hands were given a like increase.

The new rod mill now in course of erection by the New Castle Wire Nail Company, at New Castle, Pa., will have a capacity of about 150 tons of nail wire per day and will employ 200 men. The company will use about 100 tons of this product per day and will dispose of the rest.

The ore property formerly owned and operated by the Pittsfield Iron and Steel Company, of Pittsfield, near Rutland, Vt., including concentrator, Catalan forge and machinery, is offered for sale by U. K. Flagler, Boston, Mass.

The works of the Trinidad Rolling Mill Company, at Trinidad, Col., have begun operations. The works have a daily capacity of 25 tons of merchant iron. The machinery consists of a battery of four 125 horse-power boilers, feed-water heater and steam boiler and supply pumps, one 500 horse-power engine, operating an 18-inch bar train complete, a 300 horse-power engine with 12-inch roll train, two heating furnaces, large and small shears (with independent upright engines), cold saw, lathes, cranes and all other necessary appurtenances, the machinery having been made by the Lewis Foundry and Machine Company, of Pittsburgh. The product will consist of square, flat, round, half-round, diamond and mine T-rails. In this connection the New Mexican Iron Company make a proposition to Trinidad for the location of an iron blast furnace at that point.

The National Forge and Iron Company, of Chicago, have made arrangements to build their works at East Chicago, Ind., where they have secured a tract of 12 acres, with excellent facilities for rail and water transportation. The proposed location at Burnside was abandoned because of conflicting claims over the ownership of the land. The site now secured is in the immediate vicinity of the works of the Chicago Horseshoe Company and the car-wheel works of C. A. Treat, both of which are nearing completion. The machinery for the forge company is all under contract, and the erection of their buildings will be actively pushed in order to receive it as soon as it is ready to put in place.

The *Mining and Scientific Press* is authority for the statement that the Puget Sound Iron Works, at Irondale, Wash., will increase their capital stock, which is now \$1,000,000, with the view of

erecting rolling mills, to engage in the manufacture of steel and wrought iron in connection with their output of pig iron.

Machinery.

The Westinghouse Electric Company, of Pittsburgh, have received an order for 3000 incandescent electric lamps for a central station plant at St. Joseph, Mo.

The stockholders of the Arms, Bell & Co. Nut and Bolt Works, at Youngstown, Ohio, destroyed by fire two weeks ago, have decided to rebuild as soon as their insurance is adjusted. An entire new line of the most improved machinery will be placed in the plant, the intention being to make it a model concern.

The Ottumwa (Iowa) Iron Works, manufacturers of coal-mining machinery, have just issued a catalogue from which a good idea can be formed of the various machines made by them. Their catalogue shows their first and second motion hoisters, their tail-rope and endless-rope engines, pumps, ventilating fans, elevators and cages, coal cars, pulleys and shafting, presses, rolls and grinders, pipe and fittings, &c. The catalogue also describes the Ramsay coal distributor, which is made by the Ottumwa Works.

The new illustrated catalogue of the Rand Drill Company, of this city, contains, in addition to descriptions and engravings showing the various machines they manufacture, much interesting and valuable information relating to mechanics. The catalogue is divided into four parts, the first of which treats of drills and mountings, air compressors, boilers, air receivers, pumps and supplies, pipe and fittings. The second book, bearing the title "Useful Information," deals with compressed air, steam, transmission of power and miscellaneous matters. The third book is entitled "Work Done," and illustrates mining, quarry, tunnel and sub-marine work. The last book contains comparisons and tests. The engravings are fine specimens of work, and were so selected as to well illustrate the various products of the company. Much of the "Useful Information" is original, and will certainly prove "useful" to those studying the subjects treated.

The Buckeye Engine Company, of Salem, Ohio, have just published three catalogues, bound separately. The first describes and illustrates all the parts of the engines made by this company, so that an accurate conception can be formed of their construction and operation. The second presents a few admirable wood-cuts of different types of engines, after which follows an instructive description of the use and management of the indicator and useful data on steam and steam-power plants. The matter bears evidence of careful preparation, and will be found of value by those interested in steam. The third part is a list, covering some 36 pages of type, giving the names and addresses of those who have used the Buckeye automatic cut-off engine since its first introduction in 1874. In the introduction we find the following statement: "We hope the intending purchaser who is not familiar with the merits of the engine will refer directly to any of the addresses given, and we are ready to accept an intelligent judgment of that portion of the record which he may get."

The Topeka Rapid Transit Railway, the equipment of which has just been finished by the Thomson-Houston Electric Company, was put in operation on the 3d, the trial trip, made with four cars filled with invited guests, being most successful in every way. This road is the largest in the world (14 miles, 20 miles of track) and is probably the finest electric railway in the West. The power station is located at the corner of Jefferson and Second

streets. It is a two-story building, 100 feet front and 85 feet deep, and has a 125-foot chimney. The power plant consists of two Corliss engines of 600 and 300 horse-power, respectively, steam for which is supplied by five boilers, 6 x 16 feet. The electrical apparatus consists of six 30 horse-power Thomson-Houston generators, with switchboard and all necessary appliances for the same.

The Jeffrey Mfg. Company, of Columbus, Ohio, were the pioneers in this country of coal-mining machinery, and their productions are well and widely known. They have not confined their attention to mining machines alone, but have obtained control of valuable patents for chain belting, which is extensively used for elevators, conveyors and driving belts for handling grain, coal, ores, &c.; they also control the manufacture of the Slater bolting reel, the Gregory grain drier and the Wilson spring whiffletree. Their new works consist of five departments—the foundry, machine shop, blacksmith and wood-working shop. The cutter works is equipped throughout with improved machinery especially adapted to the work.

On and after May 1 the Prentiss Tool and Supply Company, now located at 42 Dey street, will be the New York agents for the Putnam Machine Company, of Fitchburg, Mass., and will remove their offices to 115 Liberty street, where a full line of the many excellent tools made by the Putnam Company will be kept on hand.

Hardware.

The Erie Specialty Mfg. Company, Erie, Pa., have been organized for the manufacture of hardware specialties, including cork-pullers, lemon-squeezers, ice-shaves, milk-shakes, cigar-cutters &c., most of which have been invented by E. Walker, who is manager of the company.

Johnson & Colton, Montpelier, Vt., manufacturers of saddlery hardware, have recently moved to new quarters in a building 100 x 35 feet and four stories high. The change was made necessary by the enlargement of the business, which was established a number of years ago and has been growing steadily ever since.

The firm heretofore known as W. R. Baker & Sons, Watertown, N. Y., has been incorporated as the W. R. Baker Mfg. Company. They will continue making special and boat hardware, and with additional capital will increase their manufacturing facilities and enlarge their plant. Their foundry facilities especially will be greatly increased, and they will hereafter be able to furnish brass and bronze castings for all purposes. W. R. Baker, the president, will, as heretofore, have charge of the mechanical department; W. W. Sherman, the treasurer of the company, will manage the general office affairs; and Pitt J. Baker, secretary, will take charge of the general selling and advertising of the concern.

The business of the Withington & Cooley Mfg. Company, Jackson, Mich., is increasing so rapidly that additional room is needed, and they are now having the plans drawn for a large building to be erected just north of their office and warehouse. The exact dimensions of the building are not yet announced, but it is stated that it will contain about 25,000 square feet of working room. It will be of brick, two stories in height, with a basement. When completed it will be used as their wood-working department, the work of putting handles on the tools being done there. This will give employment to about 50 men in addition to their present force. The company, we are advised, have recently been obliged to refuse an order for 14,000 dozen Forks from France because they had not the facilities to fill

it. The company are investigating the merits of crude petroleum as a fuel. Three new boilers are also being put in.

Miscellaneous.

A press dispatch from Akron, Ohio, under date of the 19th inst., says: "A meeting of Akron capitalists who had subscribed \$25,000 among themselves and Messrs. Loomis and Loyd, of the Loomis Fuel Gas Company, was held in this city to-day and arrangements made for the incorporation of a company with \$100,000 capital to build a fuel gas plant in Akron immediately."

The largest compressed-air establishment in the world is at Paris. It has a plant with 5000 horse-power. Begun in 1881 to distribute the power necessary for the driving of pneumatic clocks, it was not long before it was discovered that the air could be profitably used for two other purposes—to distribute motive-power to manufacturers by day and to produce electricity for lighting by night. The works, which are on the heights of Belleville, on the edge of the city, now occupy an area of 107,500 square feet, or 2½ acres, two-fifths of which is covered with buildings.

A new company has been formed in Norristown, Pa., for the manufacture of steam heating boilers, &c., under the name of Schimpf & Keim Boiler and Mfg. Company, Thomas G. Lovegrove, of Philadelphia, president.

The Lehigh Zinc and Iron Company, of Bethlehem, Pa., have purchased the Joplin Zinc and Smelting Works and 2140 acres of mining lands within a few miles of Joplin, Mo. A greater portion of the territory has already been developed and is ore producing. The aggregate price of the various properties is reported to have been about \$175,000. The company will at once enlarge the zinc smelting works and add a plant for manufacturing sheet zinc. To this enterprise the citizens contributed \$10,000, the company later agreeing that the plant shall have a capacity of producing 20,000 pounds of manufactured zinc a day, and to cost not less than \$250,000.

The Wetmore Canning Factory have just been organized at Wetmore, Nemaha County, Kan., and are making arrangements for the prosecution of their business. Their capital stock is stated to be \$10,000.

Among corporations recently authorized by the State of Illinois are the following: Northwestern Horse-Nail Mfg. Company, Chicago; capital, \$250,000; to manufacture horseshoe nails and other metallic products; incorporators, Russell Jones, John R. Corwith, Charles Fargo. The Murphy Car-Door Company, at East St. Louis; capital stock, \$50,000; for the manufacture of freight-car door fasteners; incorporators, P. H. Murphy, W. S. Wilson, D. Kennedy and F. W. Smith. The Page Woven Wire Fence Company, at Chicago; capital stock, \$40,000; for the manufacture of wire fence and machinery for manufacturing the same; incorporators, N. L. Clement, Austin Clement and Edward B. Bacon. The Lone Star Iron Company, at Chicago; capital stock, \$1,000,000; for mining, smelting and manufacturing iron products; incorporators, John A. Kruse, P. J. Howard and E. P. Atfield. The Osborne Steam Heating Company, at Chicago; capital stock, \$20,000; to manufacture and operate appliances for heating, power, lighting and other purposes; incorporators, Jesse Cox, Gideon F. Lanaghan and Eugene F. Osborne. A certificate was filed to record the increase of the capital stock of the Griffin Wheel and Foundry Company, of Chicago, from \$100,000 to \$150,000.

The Iron Age

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A Western View of the Pittsburgh Freight Question.

The Chicago iron and steel manufacturers are naturally very much interested in the agitation of freight tariffs by the Pittsburgh manufacturers. The former understand the situation very thoroughly, having themselves been handicapped at times in the past by freight rates which operated to their disadvantage and consequently benefited their trade competitors. A man familiar with the course of the iron trade for but a few years can recall instances of this kind. Chicago was then at the mercy of the older iron centers of the East whenever prices of finished products were very much depressed. Raw materials were always dearer and wages were higher, while the railroads had a system of rebates which gave the Eastern manufacturer an advantage that could not be accurately measured, because it was usually shrouded in secrecy. The growth of Western manufacturing establishments was, under such circumstances, the creation of periods of activity when Eastern works could not supply the demand. It is not singular that Eastern manufacturers hope to keep up the old order of things and believe that they should still control the markets of the West. The discrimination of the coke-carrying railroads in favor of Chicago is regarded as the one impediment in their way, and they insist upon its removal. The Ohio manufacturers of pig iron also find themselves handicapped by the high freight rate to Chicago on their product, and they are seeking to have it reduced to the figures of former depressed times, so that they can again, as they believe, reach the Chicago consumer. On all sides the railroads are attacked as the chief offenders in keeping Eastern products from getting their share of Chicago business.

Now, the Chicago manufacturers do not see matters in the same light. Remarkable changes have occurred in the recent history of the iron trade, and they have inured steadily to the benefit of the men who risked their fortunes on the southern shores of Lake Michigan. Raw material has been greatly reduced in cost, labor is much more abundant and wages are not so extravagantly high as they once were, capital can be had without the enforced payment of usurious rates of interest, and the new Interstate Commerce act at least puts all competitors on an equal footing in requiring open rates to be made. The Northwest has at last become a practical manufacturing district, able to operate independently, and it moves forward in dull times, instead of only marching in company with the older sections of the country whenever the bugle of prosperity sounds an advance.

According to our Western friends, the war upon the high freight rates which now

disturb the serenity of the once imperturbable Pittsburgh community is not attacking the root of the difficulty. The increased cost of manufacturing iron and steel due to the excess charged over what is claimed to be a just rate will not restore to the East its former supremacy in Western markets if the reductions asked are granted by the railroad authorities. The Western manufacturers will endeavor to meet the new conditions of trade, and their progress in the recent past appears to give them a confidence in the future which they at one time did not possess. The struggle between the East and the West has begun on a more favorable footing to the latter, and it would not be surprising to see concessions made by the former which were wholly unanticipated but a few years since.

Our sympathies in this matter are with both sections. The real trouble arises from the dullness of trade, which prevents even the leading establishments of any part of the country from securing orders sufficient to keep them running at a profitable rate. Until business revives this general feeling of dissatisfaction and restiveness will continue, and all items of cost and charges will be attacked in the hope that they can be scaled down. The freight rates now charged were not deemed high until competition began to pinch the manufacturers in quarters in which they had previously had little trouble in getting business. It would be idle to counsel patience to men under such circumstances. Impatience will not hasten the return of prosperity a month or a day or an hour. The chief cause of trouble in the iron trade to-day is the limited demand from the railroads, whose net earnings are too small to enable them to buy what they really need.

Emphasis is given to the statement recently made in *The Iron Age* that the prosperity of iron and steel makers abroad, in spite of small orders from this market, is due to the larger business in other quarters, by the figures lately published in England and Germany. William Fallows & Co., of Liverpool, estimate that home consumption of pig iron in 1888 was 4,133,016 gross tons, as compared with 3,170,160 tons in 1887, 3,342,221 tons in 1886 and 3,626,192 tons in 1885. In other words, English consumption jumped nearly a million tons. This is partly due, of course, to a better demand for machinery for export, the Board of Trade returns showing £9,745,685 in 1888, as compared with £8,330,971 in 1887 and £7,124,270 in 1886. The greatest progress in any one industry has been in ship-building, the tonnage completed in 1888 having been over 900,000 tons, while at the beginning of the current year the new shipping laid down or contracted for reached the enormous amount of about 1,250,000 tons. It is necessary to state, however, that this has begun to tell on rates of freight throughout the world, a decline having set in during the past month. Germany, too, has experienced a revival which explains the indifference of its manufacturers to American orders. Statistics recently published show that the consumption of pig iron in Germany increased from 3,798,459 metric tons in 1887 to 4,281,199 tons in 1888. It is certainly not surprising that with nearly 1,000,000 tons added to

the consumption in England and 500,000 to that of Germany the European makers can see the American demand reduced to a minimum without feeling its absence keenly.

The Report of the American Iron and Steel Association.

The statistics of the production of all forms of iron and steel in the United States in 1888 will be found in very compact shape in the annual report which has just been issued by James M. Swank, general manager of the American Iron and Steel Association. This report has been printed earlier in the year than any of its predecessors, and thus comes more closely to realizing the full value of statistics of the character treated in its pages. In this respect no statistical office in the world, particularly those operating under the direction or patronage of the various governments, has as good a record. The fullness of detail which has always characterized the association's reports is a conspicuous feature of this latest addition to their publications. The leading products of the iron and steel industries of the country are shown to have been as follows in the past calendar year as compared with the preceding year, using gross tons, which the trade generally employs:

	1888. Tons.	1887. Tons.
Pig iron.....	6,480,738	6,417,148
Bessemer-steel ingots.....	2,511,161	2,336,033
O.-H. steel ingots.....	314,318	322,069
Crucible-steel ingots.....	70,279	75,376
All forms rolled iron.....	2,153,263	2,311,161
All forms rolled steel.....	2,464,067	2,024,545

Included in the totals of the above table are the following products, which are given separately to avoid duplication and perplexity, also using gross tons:

	1888. Tons.	1887. Tons.
Bessemer-steel rails.....	1,386,377	2,101,904
Iron rails.....	12,725	30,591
O.-H. steel rails.....	4,097	17,145
Iron bars and shapes.....	1,024,629	1,711,967
Steel bars and shapes.....	689,301	472,312
Iron plates and sheets*.....	419,059	425,943
Steel plates and sheets*.....	190,798	177,412
Iron cut nails.....	96,879	152,660
Steel cut nails.....	193,012	155,772
Wire nails.....	66,964	55,804

* Excluding nail plate.

From these tables it will be seen that the production of 1888 corresponded very closely with that of 1887 in almost every line, in some cases making a decided gain, as in pig iron, steel bars and shapes, steel plates and sheets, steel cut nails and wire nails. The only falling off of consequence was first in Bessemer steel rails, accompanied by a natural decrease in the production of Bessemer steel ingots, and second in iron cut nails, which seem to be very rapidly going out of use. Apart from these two special interests, therefore, the year 1888 afforded a fairly good demand for iron and steel products.

For the first time the wire-rod production of the country has been ascertained. It appears that in 1888 the production of iron wire rods was 13,010 gross tons; of steel wire rods, 266,759 tons; total, 279,769 tons. The growing importance of this industry, however, would seem to entitle it to more space in the report than the brief paragraph in which these statistics are recorded. This is the more noticeable also from the fact that this business is now passing into the control of domestic manufacturers, and that we have nearly seen the last of heavy importations of rods. Rolling mills are now being erected in several parts of the country to manufact-

ure wire rods exclusively, so that the prospects are bright for a great increase in production this year over last year. And more mills of the kind are projected. What was once almost a lifeless industry is rapidly climbing its way to prominence.

But we did not start out to criticise this report, and have no intention to detract from its obvious merits in the least. We would like to make a suggestion, however, relative to tables of prices of iron and steel products. Philadelphia and Pittsburgh are time-honored centers of consumption of iron and steel, and should have a place in tables of prices. But the country has changed marvelously in late years, and other centers of iron production and commercial activity in iron have attained prominence. Cincinnati, Louisville, Birmingham, Cleveland, Chicago and St. Louis are iron centers whose prices move in slightly different orbits from those of Philadelphia and Pittsburgh. Their prices should also be preserved from year to year. The changes which have occurred merely in the past five years would form a very interesting study to many an iron manufacturer who has found his old markets slipping away from him. We would also like to make another suggestion, which occurs to us after reading the "General Review of the Domestic Iron Trade in 1888." The course of the demand for steel rails is no longer the key to the whole situation, although that was the case for years. During the last half of 1888 the market cut loose from the depressing influence of the poor business done in steel rails, and from the middle of July to nearly the middle of October a most excellent demand was experienced for pig iron, bar iron and a great many other iron as well as steel products, and prices were forced to a somewhat higher level. A study of steel-rail prices does not show this, of course, but a study of other prices would. Barring steel rails, the year 1888 was quite a good year for American manufacturers of iron and steel, some of whom even felt encouraged in September and October to advance their workmen's wages. We have no doubt that they would be very glad to have a continuance of the average of the first ten months. It may be strictly true that, as the report states, "the producers of Lake Superior and other domestic iron ores were more prosperous in 1888 than those who purchased their ores," but we would like to hear the evidence on both sides of this subject. The ore producers seem to be very positive that in 1888 they were the sufferers.

Hard on the heels of the estimates of the *Chicago Railway Age*, which were received very skeptically, come statistics compiled by the *Railroad Gazette* bearing on current railroad building. Our new contemporary makes the mileage of new track laid during the first quarter of the year 474 miles, against about 1000 miles in the corresponding period of 1888. This would indicate a total mileage of 3500 miles for 1889, against 7000 miles last year, if the same ratio be maintained. The *Railroad Gazette*, however, maintains that it is quite impossible to predict how much of the work now under way, aggregating 4221 miles in the United States, Canada and Mexico, will be carried forward during 1889. It is possible that it may be actively rushed, or that it may progress

very slowly. That will be determined by the success which projectors may have in perfecting their financial arrangements. A few weeks may change the situation in the money centers, and where hesitation and distrust now reign supreme eagerness and confidence may prevail. Thus far the outlook is certainly not promising.

Late Developments in the Russian Petroleum Regions.

Although Russian petroleum has not yet become a very formidable competitor of ours, it is good to watch what is going on in the Caucasus, this industry being pushed with great vigor and certainly giving astonishing results in many ways. Considerable discussion has been going on in Russia as to the advisability of laying a pipe line from Baku to the Black Sea, but although the capital for it has been in readiness for some time past, the Russian Cabinet is for the present at least opposed to the project, especially the Ministry of Communications. A considerable portion of the petroleum finds its way into the interior of Russia by ascending the river Volga; if, therefore, a pipe line should convey it almost exclusively to the Black Sea, the Government apprehend serious difficulties, most of the steamboats on that river, the factories on its banks and the railroads traversing the regions using naphtha as a fuel. The Government even intends to go further, and is making arrangements to have the residue utilized by the railroads subsidized by the State, hoping that they will then be run cheaper and that the saving will amount to millions of rubles. Besides, a fleet of steamers and lighters has been built for the conveyance of naphtha not only on the Volga, but on the Caspian Sea, and it would be ruinous for them if suddenly a pipe line were to take the bulk to the Black Sea. The latter region, moreover, is by no means dependent on that kind of fuel alone, inasmuch as it has within easy reach both Russian and Caucasian coal, and can import foreign without difficulty. A pipe line would be injurious besides to the interests of the Transcaucasian Railway—now conveying the petroleum—and the Government takes a special interest in seeing the same prosper. It even contemplates buying it. If the pipe line were laid now, at a time when the productiveness of the Caucasian oil region is not yet fully developed, Russian petroleum would soon be cheaper in Central and Western Europe than in the interior, while in the provinces watered by the Volga an insufficient supply of a cheap fuel would again lead to the destruction of forests, the very thing the men in power want to prevent.

Those taking a different view of the matter are of the opinion that the present owners of the Transcaucasian Railway or the Government, should it buy the line, can easily place the same in a position to defy any pipe line or lines. The number of tank-cars would have to be increased, the line be double-tracked, and this would coincide with the finishing of the Suram tunnel. They assert that the present freight rate of 16 copecks per pood could then be reduced to 10 copecks and yet leave a good margin, whereas the pipe applications for a concession are based on 11 copecks per pood. At 16 copecks the

railroad forwarded last year 32,000,000 poods of naphtha products, the pood equaling 36½ pounds American. As at the same time both the Persian and Central Asiatic trades are expanding—it is believed the Transcaucasian Railway will soon transport a good deal of merchandise in transit in that direction—the question arises whether Baku is in position to procure petroleum enough both for a double-track railroad and a pipe line, the more so as another railway line is projected—the Baku-Petrowsk-Rostow—which will also convey petroleum. Those who believe that sooner or later a pipe line will be laid in spite of the present Government opposition, the latter no doubt soon modifying its views in this respect, insist that production, not fully developed now, will soon become so exuberant that means will have to be found to get all the oil out of the way. Now, the pipe line would convey crude, and at its terminus on the Black Sea refineries would be erected. They seem to feel convinced that there will be oil enough to feed both the railroads named and one or two pipe lines. At any rate, the Government looks upon a pipe line as premature at present. In a couple of years those advocating it may nevertheless see their hopes fulfilled, and in some shape or another Russian oil may then be made to compete with ours in Europe.

We have reason to believe that work upon the Hudson River Tunnel will now be carried forward until it has been completed or else permanently abandoned. The rumors which have been circulated in the papers during the past few weeks concerning the raising of capital—\$1,500,000—in England to prosecute the work appear to be founded upon fact. We are not yet informed whether the plans formerly pursued will be adopted in the new work or not, but it is probable that operations will be prosecuted under the control of English engineers. The distance between the New York caisson and the Jersey City shaft is 5600 feet. The north tunnel has been finished about 1900 feet from the western shore and about 200 feet from the eastern shore, leaving a distance of 3500 feet yet to be completed before the headings of this tunnel meet. The south tunnel has been completed about 550 feet from the west and 50 feet from the east shore, leaving a length in that case of 5000 feet. No attempt has yet been made to provide terminal facilities at either end, the object all along being to first complete the submarine portion of the work and afterward lead the tunnel to an outlet in New York at the most desirable point. Land damages and traffic facilities, of course, will govern the selection to a great degree.

Southern Freights.—The Southern Railway and Steamship Association have issued a circular, under date of the 19th inst., announcing that on the 1st of May the rates of freight will be based on \$2.75 from Birmingham, \$2.25 from Chattanooga and \$2.50 from Sheffield to Cincinnati, \$2.50, \$2.25 and \$2.25 respectively to Louisville, and \$4, \$3.75 and \$3.75 respectively to Chicago. On the same date a special tariff on manufactured iron was sent out making the rates to Chicago 24 cents per 100 pounds from Birmingham and 22 cents from Chattanooga, 12 and 10 cents respectively to Cincinnati, 14 and 13 cents to St. Louis, and 11 and 10 cents respectively to Louisville, Ky.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 23, 1889.

The action of the appraiser at Philadelphia in classifying worsted cloths at the lower rate of duty, with woolen cloths at a higher rate, is the beginning of a policy of rigid construction on the basis of high duties by the Secretary of the Treasury. Under the rules of the Department it is customary for the appraiser simply to place his appraisement upon imported articles and refer it to the collector. The collector, however, is not compelled to accept the appraisement, but can go on collecting the duties the same as before. The collector at Philadelphia does not agree to the appraisement in this case, and is therefore disposed to collect the duty as heretofore, at lower rates. The appraiser was summoned to Washington yesterday, and explained the situation to the Treasury authorities. He was directed to return to Philadelphia and insist upon the collector forwarding the appraisement, so that the Department officers might have the question before them for a decision. Should the collector decline to forward the papers his removal will follow in a few days, as a Republican has already been selected for his place. It is probable that the collector will decline to comply with this exceptional proceeding.

There are several items in the iron schedule which have for some time been entered under a purely technical or forced construction of the law, which enables these articles to pass the Custom-House at a lower rate of duty. Not only will this be stopped and classification be made under a more rigid construction of the customs laws, but a general inquiry will be made respecting the assessment of duties on a number of imports of iron and steel, to see that the law is not evaded. The articles shall pay full duties and the American markets be protected thereby. It is evident that the Department is disposed to break up the system of technical construction of schedules and undervaluation as a means of facilitating foreign articles getting into the American markets.

The Secretary of the Treasury appreciates the fact that this Administration came into power on the sole issue of protection, and if there be any merit in high classification he proposes to take advantage of it and give the American markets full opportunity to reap the benefits.

The Treasury authorities have commenced to get the material together preparatory to the submission of certain tariff conundrums to the collectors of ports for investigation and reply. The Senate tariff bill, which is supposed to represent the most advanced ground of Republican ideas on this subject, contained certain defects which were to be corrected by the Senate. They will now be given trial in actual practice.

The controversy into which Senators Sherman and Quay have fallen over a question of patronage will prove a source of embarrassment to Representative McKinley, who was one of the prominent candidates for the speakership. The Pennsylvanians who have been circumvented by the Ohioans are now declaring that the 21 Republican votes of the delegation will be thrown solidly for Reed or for some Western candidate other than McKinley. The probability is that when the voting begins in caucus Representative Burrows will come up stronger than any of his rivals.

The correspondence received here from various parts of the country indicates that the prospects of large appropriations for additional vessels of the navy will greatly stimulate the iron and steel industry. It is claimed that an expenditure of \$10,000,000 a year in naval construction and

coast defense, which will create a large consumption of both iron and steel, will about cover the gap which usually lies between active markets and good prices and the unsatisfactory conditions of overstocked markets.

Secretary Tracy is giving attention to the study of naval construction. By the time Congress reassembles he will have before the President a comprehensive plan which will insure large and active Government purchases in the iron and steel market.

American Society of Mechanical Engineers.

The Erie meeting of this society will be held Tuesday to Friday, May 14 to 17, inclusive. The selection of this place of meeting is a happy one, being in the center of a country teeming with appliances of interest to the mechanical engineer, and the study of which cannot but result most beneficially. The programme of the meeting contains topics of live interest, and is as follows:

First session, Tuesday evening, May 14, address by ex-President Horace See, followed by social reunion.

Wednesday morning session: Reports of council, tellers, committees and general business and professional papers as follows: Thos. S. Crane, "The Piping of Steel Ingots;" Henry R. Towne, "Gain Sharing;" Chas. H. Manning, "Comparative Cost of Steam and Water;" D. W. Robb, "The Old Locomotive 'Sampson';" James W. See, "Standards." At the evening session the following papers will be presented: Samuel Webber, "Notes on the Comparative Loss by Friction in a Transmitting Dynamometer under Different Loads and Speeds;" J. Burdett Webb, "Note on the Steam Turbine" and "An Error in the Encyclopædia Britannica;" Jas. E. Denton and D. S. Jacobus, "Steam Consumption by Engines at Various Speeds;" Jas. E. Denton, "Performance of a 35-ton Ice Machine."

On Thursday morning the following papers will be read: De Volson Wood, "Expansion of Timber due to Absorption of Water;" "Some Properties of Ammonia;" "Formulas for Saturated and Superheated Vapors," and "Some Properties of Vapor and Vapor-Engines;" A. F. Nagle, "Cornish or Double-beat Pump Valves;" A. W. Jacobi, "Improved Motion Device for Engine Indicators;" F. W. Dean, "Distribution of Steam in the Strong Locomotive" (supplement); Jay M. Whitam, "Cylinder Ratios in Triple Expansion Engines." The evening session will be given up to the following subjects: Scott A. Smith, "Belt Traction on Pulley Faces;" John H. Cooper, "On the Longitudinal Riveted Joints of Steam-Boiler Shells;" Lewis F. Lyne, "Bits of Engine-Room Experience," and "Kerosene Oil in Steam Boilers" (supplement).

Invitations have been extended to the society, through the local Committee of Arrangements, to visit the following places of interest: Stearns Mfg. Company Machine Shop, Erie City Iron Works, Jarecki Mfg. Company, Skinner Engine Company, H. F. Watson Paper Mill, Pumping Station of Water Works, Weschler's malt-house, Cleveland & Hardwicke Machine Shop, Ball Engine Company, and T. M. Nagle's machine shop. It is also intended to have a sailing party upon Presque Isle Bay and Lake Erie, at which time a visit to the pumping station and stand-pipe of the Erie Water Works will be made, and an exhibition drill will be witnessed at the Life Saving Station on Presque Isle.

Topical discussions, which have added so much to the interest of recent sessions of this society, will be continued at the coming meeting. The questions to be discussed are as follows:

What form of self-oiling boxes have you found the best for line and countershafting? Can you give figures as to economy of oil as compared with other methods?

What form of oil-cup or lubricator do you find most economical for use on machines requiring constant lubrication?

Have you any experience as to the use of machines for hand or power for facilitating foundry molding? Can unskilled labor be employed?

Is it right or wrong in theory to put a central support under the bed of engines of the Corliss type? Do you know of any bad results from its use or from its absence?

Does it prevent nuts from working loose or prevent breakage of bolts to reduce their cross-section between the head and the nut?

Did you ever meet with either of these cases? Did the unequal wear when a long slide works in short guides amount to enough to become objectionable? Did the unequal wear of a short piece working in long guides amount to enough to become objectionable?

Have you tried the plan of applying electro-motors to mechanical operations requiring not more than ten horse-power? Can you compare their convenience and economy with those of small engines or the usual transmissions by belting and shafting?

Is there any better plan to protect steel from corrosion than to japan it?

Have you successfully soldered aluminium? Can a luminium be welded by electricity?

Have you any experience in hardening machinery steel or in case-hardening it?

What are the relative advantages of the time-card and the time-book systems for keeping time in factories?

The usual arrangements have been made by the society for special rates for railroad fare to and from the convention. Full particulars will be furnished by F. R. Hutton, secretary, 64 Madison avenue, New York.

The Connellsville Coke Trade.

Advices from Pittsburgh are to the effect that the condition of the coke trade is steadily growing worse, the number of idle ovens now aggregating nearly one-fourth of the total number in the Connellsville region. Continued overproduction has resulted in a cutting of rates, with the result that sales have been made within the last few days at \$1 per ton, and it is hinted that bottom prices have not yet been reached. The operations of the 77 coke plants in the Connellsville region for the week ending on Saturday, the 13th inst., show 10,895 of the 13,266 completed ovens in blast and 2371 idle. Quotations are made as follows: Furnace coke, \$1.05; to dealers, \$1.15; foundry coke, \$1.25; crushed coke, \$1.50.

James Benbow Elliman, a prominent iron merchant and importer in Pearl street in the days before the war, was buried at Flushing, L. I., 18th inst. He was a native of Coventry, England, and 82 years old at his death. Mr. Elliman came to New York in 1831 as agent for Joshua Scofield & Sons, one of the largest iron houses of Birmingham. He afterward went into the iron business with his brother, forming the firm of Elliman Brothers, of 211 and 213 Pearl street, which continued in business until the breaking out of the war, since which time Mr. Elliman's life was spent in domestic retirement. He was the oldest life member of the St. George's Society, and was noted for the wide extent of his knowledge and open-handed hospitality and benevolence.

The Burden trial at Troy, N. Y., has been postponed until July.

The New Steamer Puritan.

The palatial steamer Puritan, just completed for the Fall River Line, and which is expected to surpass in several respects her elegant consort, the Pilgrim, went on her trial trip last Monday to test her engines. Only the builders of the engines, Messrs. W. & A. Fletcher, a member of the Fall River Company and a few personal friends were on board. The Puritan went about 5 miles outside of Sandy Hook, a distance of 25 miles, and returned to her pier, covering the 50 miles in about five hours, or an average of 10 miles per hour. The machinery worked to a charm. This vessel is the largest in the line, and her estimated cost is \$1,500,000. Her hull is of steel, built on the double-hull, bracket-plate, longitudinal system, with 96 watertight compartments. In addition there are six water-tight bulkheads, dividing the hold into seven water-tight compartments. She is supposed to be practically unsinkable. She is 403 feet long on the water-line, 420 feet over, or 30 feet longer than the Pilgrim. Her hull is 52 feet broad and 91 feet over the guards. The depth of her hull is 21½ feet, and she draws 13 feet of water when loaded. The interior of the steamer is finished in white and gold, and she has 350 staterooms, or 100 more than the Pilgrim. It is estimated that she can carry 1500 passengers comfortably. A single screw, driven by a compound beam engine of 7500 horse-power, propels the boat. The high-pressure cylinder measures 75 inches in diameter, with a 9-foot stroke, and the low-pressure 110 inches, with a 14-foot stroke. Her power is about 42 per cent. greater than the Pilgrim's. She has eight boilers, with a working pressure of 110 pounds to the square inch. The Puritan will leave for Newport the latter part of this week to receive her furniture and carpets.

The Eames Vacuum Brake Company, in their new forge shops at Watertown, run their hammers entirely by compressed air. The air is compressed by water-power. It is said that they find not only economy, but greater efficiency, in the use of air for this purpose than with steam. The air pressure is kept at about 80 pounds to the square inch, but if any specially heavy work is required it is quickly brought up to 100 pounds. The action is very quick and sharp, as the free exhaust causes no back pressure, and they are enabled to do with their largest hammer—10 x 28 inches—work that would require a larger steam hammer, using steam at the customary pressure. The compressor is placed in a separate building near the water-wheel. A reservoir is placed near the compressor to take the water of condensation, and another one is connected overhead with the hammers in the forge shop. Compressed air is also used for various purposes in the machine shop of the company. By the use of this compressed air in the hammer all trouble from condensation, which must be present to some degree with steam hammers, is avoided, and the shops are kept cooler without the heat radiated from the steam boiler, pipes and cylinders.

The entrance examinations of the Massachusetts Institute of Technology will be held at Boston and at a number of different points throughout the country on the 29th, 30th and 31st of May.

The Pittsburgh and Lake Erie and New York, Lake Erie and Western roads have announced the following new lake rates from Pittsburgh to Port Huron points, to take effect on the 15th inst: To Marine City, St. Clair and Port Huron, Mich., first class, 40; second, 35; third, 26; fourth, 19; fifth, 17; sixth, 14. Port Sandilac,

San Beech, Osceola, Ausable, Alpina, Cheboygan, Mackinac Island and St. Ignace, 60, 50, 36, 24, 22 and 20 cents per 100 pounds. The difference between these and the rail rates ranges from 5 cents to 1 cent on the different classes. Articles of iron and steel have been made fifth class in less than carloads and sixth class in carloads.

Drilling Cast Iron.—L. B. Brickenbridge, the instructor in mechanical engineering in the Lehigh University, has lately been making some experiments for the determination of the pressure exerted in drilling cast iron. He made a cylinder, in which was a plunger, having an area of 10 square inches. Three small grooves were turned in the plunger near its lower end, so as to prevent any leakage of the oil with which the cylinder was partly filled. Two holes were drilled in the cylinder near the bottom, and a steam gauge and an indicator were attached. The indicator cord was attached to the hub on the shaft of the quick return motion lever, in order to obtain diagrams of considerable length. When the piece to be drilled was resting on the plunger a diagram could be taken which would show the pressure exerted in forcing the drill through the work. With ¼-inch twist drill the greatest downward pressure was 400 pounds; with ½-inch, 900 pounds; with ¾-inch, 1100 pounds; with 1-inch, 1450 pounds, and with 1¼-inch, 1800 pounds.

The American Society of Mechanical Engineers has changed its quarters from the Stewart Building to No. 64 Madison avenue. The change is desirable, because of the more central location of the new rooms and especially because of their more commodious arrangement. We trust that the society in its new domicile will continue to grow and increase its usefulness as it has in the old.

The New York Sinking Fund Board have approved the preliminary plans and specifications for the new criminal court building in Centre street presented by the sub-committee and ordered the committee to advertise for architects' competitive plans. The building will be five stories high and will occupy the whole block bounded by Centre, Elm, Franklin and White streets, just north of the Tombs. It will be fire-proof throughout, heated by steam and furnished with a sufficient number of elevators, and will be connected with the Tombs by a covered iron bridge.

New Birmingham, Tex., is coming into notice as a prospective iron center. While all sections of the State are spoken of as prosperous, the new town is especially vigorous. Myron C. Wick, manager of the large iron smelting and manufacturing firm of Cartwright, McCurdy & Co., of Youngstown, Ohio, and Robert Bently, the general manager of the Ohio Iron and Steel Company, of Youngstown, who were visitors there recently, expressed the opinion that the quantity and quality of iron ore surrounding New Birmingham, and the success of the State furnace at the penitentiary, were alone sufficient to insure a rapid growth in manufacturing enterprises.

On the 23d inst. Jacob Reese was granted a patent for which an application was filed June 27, 1879, and which, therefore, has been pending for nearly ten years. It is assigned to the Bessemer Steel Company, Limited, of Philadelphia. It covers the process of decarbonizing and desilicizing in a Bessemer converter, and subsequently dephosphorizing in a basic bath in an open-hearth furnace.

W. A. Conley, of Charleston, S. C., has been elected president of the Bessemer Lands Improvement Company, of Bessemer, Ala.

Marville W. Cooper was appointed by the President Appraiser of Merchandise in the District of New York, on the recommendation of several dry goods merchants. He was a prominent candidate for collector under President Arthur, and is considered to be a very practical man.

Robert P. Porter, the editor and statistician, has received the appointment of Superintendent of the Census, and, besides a salary of \$6000, will have the disbursement of \$6,000,000 per annum.

David Harris, late assistant manager of the lower mills of Oliver Brothers & Phillips, Pittsburgh, was presented with a silver tea service by the employees of the mill on the occasion of his entering into partnership with Baldwin & Graham, stove manufacturers.

Henry J. Redfield, long connected with Morris Wheeler & Co., has associated himself with Ely & Ramsay, stove manufacturers, of Peekskill, N. Y., and 247 and 249 Water street, New York.

T. Guilford Smith is the Buffalo agent of Carnegie, Phipps & Co., of Pittsburgh and Beaver Falls.

James Forrest, secretary of the Institution of Civil Engineers, has sent to those of the American engineers who propose to visit the United Kingdom a list of the Reception Committee, formed exclusively of all members of all classes of the Institution of Civil Engineers. It includes the names of some of the most distinguished men in England.

Judge Kelley entered upon his seventy-sixth year on the 12th inst.

Thomas F. Rowland, proprietor of the Continental Iron Works, Greenpoint, has been ill for several weeks. It was Mr. Rowland who made the contract with Captain John Ericsson to build the ironclad Monitor, which had the famous fight with the rebel ironclad Merrimac. When he went to Ericsson to close the contract he said he would build her for 9 cents a pound. But Captain Ericsson said that not a fraction above 7½ cents a pound would be paid. This offer was accepted, though at a financial loss.

A telegram from Laurel, Md., says the Baltimore Automatic Transit Company have constructed there a circular track, 2 miles in circuit, upon which experiments are conducted. The system of propulsion is much the same as on the ordinary electric railway. The Edison dynamo and the Sprague motor are employed. The overhead rail is the main feature in the system, a double-flange wheel on the car and motor catching upon it when the train is in motion. The idea is to have stations 25 miles or more apart, supplied with dynamos of sufficient power to furnish electric force to drive the train for a round trip. The projectors of this enterprise expect to work a revolution in the carrying of mails and packages.

The Aqueduct Commissioners awarded to Charles W. Palmer a contract for the construction of the iron gatehouse at 185th street for \$6935, and to Cole, Wilcox & Co., for cast-iron piping at shaft 24, section A, for \$4000.

It is understood at the City Hall that Mayor Grant's rapid transit scheme has been killed in the Legislature.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 23, 1889.

The progress of the month is precisely in accordance with the gloomy predictions made at the beginning of it by leading members of the trade. The demand continues to diminish in nearly every line. Prices show comparatively little change, however, so far as open quotations are made, but there is reason to believe that these quotations would be generally shaded on transactions of any moment. Inasmuch as the prospects are very bright for an unusually active building season in this vicinity, the carpenters are threatening to strike for a uniform day of eight hours and a uniform wages rate of 35 cents per hour. Should the result be a cessation of building operations for any considerable time, the local Iron trade will suffer in a direction which just at present seems most promising.

Pig Iron.—The market was very quiet during the past week, but one or two houses reporting anything like a fair trade. The jobbing foundries are melting much less than their usual quantity of Iron, and the demand from this source, which constitutes a steady business in good times, has shrunk to small proportions. Consumers of Charcoal Pig Iron are asking in some cases to have deliveries on old contracts deferred from two to three months. There is consequently but a slight demand for Lake Superior Charcoal, and the indications are that if any large buyers were to come into the market concessions would be made on present prices. The Charcoal furnace men are resisting the downward pressure as much as possible, and, if the decision which some of them have made will be adhered to, the chances are against the sale of any considerable quantity at extremely low prices. A great deal of this year's make of Charcoal Iron will be piled to await better times. Southern and Ohio Irons have had a bad week again, only small lots of Soft Irons being called for. Bessemer Pig Iron has not been sold as such for some time. The price is nominally \$17, cash, but round lots could be had a trifle cheaper. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, \$17 @ \$17.50; Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.50; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14.25 @ \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

Bar Iron.—No class of buyers appears to have been in the field to any extent since our last report. Business has been unusually quiet. Prices of Common Iron are maintained at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago, for carload lots from mill, but sellers intimate that on good orders these rates would be cut very materially. Store trade is fair at 1.80¢ @ 2¢, according to quantity and quality.

Structural Iron.—Large orders for Beams were taken last week, and the usual complaints of slow deliveries are being heard with respect to contracts previously placed. The Beam mill of the North Chicago Rolling Mill Company is still shut down, the company having a good stock of Beams of certain sizes yet on hand. The demand for other classes of Structural

material is very light. Prices are unchanged.

Plates, Tubes, &c.—The boiler-makers report work very slack, with only a few contracts of any consequence in sight. Dealers in boiler material have therefore had a very quiet week. Prices are unchanged, the mills refusing to go lower than they have gone, and store prices still maintaining the usual schedule.

Sheet Iron.—Large buyers find Black Sheets fully \$2 per ton higher than on the 1st of the month. The mills which were disposed to sell at cheap rates have taken contracts covering as much of their capacity as they deem safe, and there is now a decided feeling of firmness along the entire line. No. 27 Common is quoted at 2.95¢, f.o.b. Chicago, from mill, for early delivery. Very little Sheet Iron is now selling from store, and old prices continue—namely, 3.10¢ @ 3.20¢ for No. 27. Galvanized Iron is dull and weaker, but quotations on small lots continue at 65 % off for Juniata and 65 % and 24 % off for Charcoal.

Merchant Steel.—A change for the worse has been made in this line, orders having fallen off quite abruptly. Prices continue nominally as previously quoted.

Steel Rails.—Orders for small quantities continue to be received with gratifying frequency by the local companies, but large orders are scarce, although a great deal of heavy business is in sight and only awaits the pleasure of capital. It is rumored that an 8000-ton contract for Michigan was taken at a very low price, but the figures which have been given currency are asserted by the sellers to be wide of the truth. Competition was very sharp, as the place of delivery is easily accessible from either Pittsburgh or Chicago, but it was not necessary to revert to the low price of last fall to get the order. For strictly Chicago business quotations are held at \$30 @ \$30.50.

Old Rails and Wheels.—The activity in Old Iron Rails which existed for quite a little time has been checked by the unwillingness of sellers to follow buyers further in the decline in prices. From \$20 to \$20.50 is now asked by holders, and buyers refuse to meet their views. The best offer made by Youngstown mills is \$21, delivered, with a freight rate of \$2.25 from this vicinity. The bulk of the Old Rails which were pressing on this market some time since has now been absorbed, and there is a firmer local tone. The demoralization of a week or ten days since has closed. Old Car-Wheels are very dull. There is now a surplus, which is constantly growing larger, and they are worth probably \$17 @ \$17.50.

Scrap.—Consumers seem to be so little in need of stock that dealers are largely refraining from offering it. A light business has been done in Cast at \$12.50 @ \$13, and Mixed Steel was sold at \$11 per net ton. No. 1 Forge is worth about \$18, while No. 1 Mill has been well cleaned up, and would probably command \$13.50 @ \$14. Old Axles are to be had at \$23. Dealers continue to buy stock whenever it is offered to them at prices which would seem to afford them a margin. Some very large transactions have recently taken place in this way.

General Hardware.—The demand for Shelf Hardware is excellent, but it is not so strong as it was in March. It is expected to slacken up from this time on for a month or two. The Heavy Hardware trade continues very satisfactory. Wagon stock was in particularly active request, some concerns having done during the past week the heaviest business of the year in this line. With respect to prices, Screws are reported to be among the firmest articles on the list; Rivets are also firm,

but Bolts are suspected of weakness in certain directions, and Nuts have been quite demoralized. In Wooden-Ware a decline of 50¢ on Tubs is noted.

Nails.—A curious ruling of the Western Classification Committee puts Wire Nails in kegs in the second class, thus greatly advancing freight rates on them. It is believed that this is merely an error, which will be corrected when the facts are laid before the committee. The factories are having a fair demand from large buyers for both Steel Cut and Wire Nails, but without special feature, except that the Jefferson schedule on Steel Nails is being beaten by some of the competitors, and it is a difficult matter now to determine the prevailing factory price. Jobbers quote small lots of Steel Nails at \$2 and Wire Nails at \$2.40, with 5¢ off for mixed carloads.

Barb Wire.—The demand is more urgent than it has been for nearly a year. The manufacturers are so far behind in making deliveries that it is getting to be difficult for jobbers to fill their orders. The price is a little stiffer, but quotations are unchanged at 2.80¢ for Painted and 3.40¢ for Galvanized in small lots.

Pig Lead.—The market is again drooping and consumers are holding off in anticipation of lower prices. Sales of about 400 tons were made at and around 3.47½¢. At the close 3.45¢ was bid.

Manufactured Copper.—Although combination prices are still quoted, an indication of the future has appeared in the offers made to dealers of lots for future delivery at lower prices, with a guarantee against a further decline.

The removals to the Rookery Building, corner of Adams and La Salle streets, during the past week embraced quite a number of Iron and Steel firms, as follows:

Pickands, Brown & Co., agents for the Bay View, Union, Joliet, Dexter, Struthers, Wheeler and Crafts brands of Bessemer, Coke and Soft Irons and the Hinkle, National, Fayette and Leland brands of Lake Superior Charcoal Irons, and dealers in Iron Ore, Old Iron Rails and Old Steel Rails. They will occupy rooms 1007, 1009 and 1011.

The Calumet Iron and Steel Company, manufacturers of Bar Iron, Steel Nails, Fish-Plates, &c. They will occupy a suit of offices, with No. 519 as their general office.

George G. Spencer, sales agent for the Laughlin Nail Company's Steel Nails and the Etna Iron and Steel Company's Bar Iron and Iron and Steel Plates and Sheets, and the Iron City Mfg. Company's Nuts. He will occupy room No. 556.

S. H. Fernandez, sales agent for the brands of Pig Iron handled by the house of Matthew Addy & Co., of Cincinnati, embracing Ohio and Southern Coke Pig Iron and Alabama Car-Wheel Pig Iron.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. PHILADELPHIA, Pa., April 23, 1889.

Pig Iron.—There is no special movement in the market at present, and in a general way things are just about as they were a week ago. The demand may be a trifle stronger, but with so many anxious sellers it is impossible to stiffen prices. All the same, the feeling favors improvement, and the conditions seem to warrant it. There is something of a scarcity of Bessemer Iron, and even a slight increase in the demand would be likely to affect prices of that class of Iron at once. As a matter of fact, it would not be very difficult to stiffen the entire line, with a very moderate increase in the demand, but while sellers continue drumming for bids

buyers feel no anxiety in regard to the future. The position to-day, therefore, seems to be that while stocks are light and prices low, the hesitancy of buyers and the urgency of sellers combine in keeping them low, and probably will continue to do so until the demand develops some degree of scarcity. It is impossible to say when this will occur, but as it is the unexpected that generally happens it may be so in this case. In any event it is not likely that much risk will be run in stocking up with good Iron at to-day's prices, although it is doubtful if that could be done to any extent without precipitating an immediate advance. Meanwhile business is being done at from \$17.50 to \$18.50, delivered at tide, for good to choice No. 1; \$16.50 @ \$17 for No. 2, and \$15 @ \$15.50 for Gray Forge. Southern (and some Western) Irons are being sold at 50¢ @ \$1 below these quotations, at adjacent points, and in some cases deliveries are made in Philadelphia at about \$14.50 for Gray Forge and \$17 for No. 1, but all depends on circumstances. What one might do under a little pressure is not accepted as any rule for another with a better Iron, or better situated financially. It is a waiting market, and as yet without any positive indications as regards the immediate future.

Blooms.—A tolerably fair business is being done in Steel, but there is no change in prices, and in actual transactions they depend a good deal on quantity, time for delivery, and requirements as to analysis, &c. In a general way quotations are about as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 7/8 "Bloom" ton of 2464 lb.

Muck Bars.—Business has been very dull during the past week, but prices are firmly maintained. There are buyers at \$26.50, delivered, but \$27 seems to be an inside figure for good Bars, and not many for sale even at that figure. Holders are a little timid in quoting for large lots, especially for summer deliveries.

Bar Iron.—There is a steadier feeling in Bars, based not so much on any particular increase in the demand as in the reduced supply locally, owing to two or three mills being shut down. Sellers are asking half a tenth more than they sold at a couple of weeks ago, and the chances are that the advance will be paid, as there is some probability of scarcity as the hot season approaches. Prices are miserably low yet, however, and the outlook far from encouraging, although, of course, the trade may jump into activity all of a sudden. There is some talk of large orders for cars, but so far there is nothing definite that can be given on that point. Prices for Bars are nominally 1.75¢ @ 1.85¢, and although there is a good deal of cutting on desirable orders, quotations are more nearly maintained than they were a week or two ago.

Plate and Tank Material.—The mills are all doing fairly, and there is a manifest disposition to ask more money on new business. A good deal of the activity is caused by the demand for material bought some time ago, and on which postponements had been asked. There is a pretty good demand, too, for new work, so that on the whole the Plate trade appears to be improving. Ship-builders have taken about 1500 tons during the week, and tank-builders nearly 500 tons, besides quite a number of orders of a miscellaneous character. Mills are full of work, therefore, until well toward midsummer; hence the unwillingness of sellers to duplicate some of their recent sales. Although firmer, prices are not notably higher, and are usually about as follows: 1.90¢

@ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

Structural Iron.—While there is nothing specially new in the market, the feeling is better, and work at the mills more general than it has been for some time past. The outlook is decidedly encouraging in this department, and there is no reason to expect anything but activity for a long time to come, as large contracts are in hand or in prospect. Prices remain as before, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet Iron.—The demand is about fair, and prices steady. Business to date has been about an average one, but as some large buyers have yet to place their orders, it is expected that the near future will develop greater activity, as there is already a good deal of inquiry. Meanwhile quotations remain about as follows:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, 1/4¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 1/2¢
Best Soft Steel, Nos. 25 to 26.....	3 3/4¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, 1/4¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 1/2 %

Steel Rails.—The demand does not improve, and orders for Rails are confined mostly to small lots, although there is some inquiry for lots of from 2000 to 5000 tons each. The feeling among sellers is firm, and at the moment it would be difficult to secure concessions, as manufacturers appear to have a good deal of confidence in the ultimate course of the market.

Old Rails.—The offerings are small, but there is so little demand that prices have not been maintained. Several hundred tons of T's were sold at equal to \$22.50 Philadelphia, and they are now offered at that figure, with \$22 bid. The market is unsettled and prices liable to sudden changes, according to circumstances.

Scrap Iron.—The market is extremely dull, and prices are easier all around. Asking prices about as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—The demand is improving and on the whole the feeling is much better than it has been. Prices are steady, with discounts about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62 1/2 %.

Nails.—The demand is very much better, and the feeling in regard to prices is also more confident. Under forced sales, in large lots, low prices have been accepted, but for good brands \$1.80 @ \$1.85 is obtained for carload lots, and \$1.90 @ \$2 for lots from store. The comparatively small output, combined with the heavy demand, ought soon to put things in better shape.

The address delivered by Andrew Carnegie before the Legislature of Pennsylvania, entitled "Pennsylvania's Industries and Railroad Policy," has been issued in pamphlet form.

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,
ST. LOUIS, April 20, 1889.

Pig Iron.—A careful review of this department during the past week shows little change from previous reports. The volume of business is small and is daily growing less, and prices, which are at present at the lowest point, are weak and sensitive, and it is quite probable would be shaded somewhat on a good-sized order. Stocks are gradually increasing, and are likely to be thrown on the market at any moment, which, to say the least, will prove disastrous, at this period especially. Furnaces are generally disposed to make the best of things, but say there is very little in the outlook on which to base any calculation for early improvement, and say it requires considerable drumming to make what few sales are reported, as consumers seem to be very well supplied for the present, and concessions offer no inducement for them to become purchasers.

Bar Iron.—This department is in more or less of a mixed condition. Some mills report a heavy demand, while others are complaining for want of orders. It is reported that a local mill went into the market last week and took quite a number of orders at prices that cannot be met by the other mills with any profit to themselves, consequently the market is in a sensitive condition, and any movement either way is likely to influence its future course. Prices are weak and for small lots 1.75¢ @ 1.80¢ is quoted, and carload lots from 1.60¢ to 1.70¢, according to circumstances.

Barb Wire.—There is a gradual improvement in the volume of business during the past two or three weeks. Mills are all pretty well employed, and prices, while not quotably higher, show some signs of strength, and mills seem disposed to hold up prices, and it is intimated that some of the sales made the early part of the month could not be duplicated. Mills are quoting from \$2.80 to \$2.85 for Painted, and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted, and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

Cleveland.

CLEVELAND, April 22, 1889.

Iron Ore.—The first vessel load of new Ore reached Cleveland yesterday. During the present week not less than 50,000 tons will be unloaded at Lake Erie ports. Along with the first cargoes of new Ore has come a strong demand from buyers and several very fair orders have been placed. Minnesota Ores are going rapidly at \$5.75, delivered at Lake Erie ports. A large block of Chapin Ore, second quality, has been sold at \$5, and over 90,000 tons of Dunn Ore, at \$4, f.o.b. vessels Cleveland, Fairport and Ashtabula, has been disposed of. The Florence Mine has made heavy sales, but at such varying prices that it is difficult to give quotations. The Commonwealth Mine has disposed of about 40,000 tons of new Ore at \$4 and liberal quantities of Ore from the Aurora and Iron King have brought \$5.25. Quotations for all grades of Ore are based upon the established price for the output of the Republic Mine—\$5.75 per ton. Probably 150,000 tons of Republic Ore have already been sold. Orders are also reported for Chippewa Ore at \$5 and for Champion at \$5.75. Sales to date, including the Chicago consolidated steel companies' purchases, are believed to aggregate 1,250,000 tons. The Eastern furnacemen having been assured satisfactory freight rates from Buffalo to the furnaces, have already purchased 150,000 tons more

Ore than was unloaded at Buffalo last season. They are still in the market and promise to care for at 700,000 tons of Ore this year. Many new contracts for carrying Ore are reported to-day at 90¢ from Escanaba; \$1.10 from Marquette and \$1.25 from Two Harbors and Ashland. Quotations are as follows:

No. 1 Specular and Magnetic Ores, Bessemer quality.....	\$5.75 @ \$6.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality.....	4.75 @ 5.25
Red Hematite Ores, Bessemer quality.....	5.00 @ 5.25
Red Hematite Ores, Non-Bessemer quality.....	4.00 @ 4.15
Menominee Range Ores, Bessemer quality.....	5.00 @ 5.25
Menominee Range Ores, Non-Bessemer quality.....	4.00 @ 4.10
Gogebic Range Ores, Bessemer quality.....	5.25 @ 5.50

Pig Iron.—The market retains all its discouraging features, in spite of which dealers refuse to believe that the hoped-for activity can much longer be delayed. Sellers have steadfastly refused to make additional concessions in order to force sales, and the few transactions reported have been at last week's quotations. The whole situation is so entirely out of harmony with the demand and prices paid for new Ore that the present depression is calculated to continue no longer than May 1. Sales during the past week have been too scattering and in too small amounts to warrant quotations of any reliability.

Scrap Iron.—Buyers still decline to give over \$21 for Old Americans, while Old Car-Wheels can be bought in liberal quantities at \$19.

Nails.—Steel Nails are still bringing \$1.90, but Cut Steel Spikes have declined to \$2.15. Steel Wire Nails at \$2.35 are in steady demand.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 22, 1889.

Pig Iron.—There has been scarcely enough business in Pig Iron in the local market during the week just closed to be a fair test of the prices current. The sales have all been small. The prices realized do not form a criterion for round lots for future delivery or even for near-by months. During the prevalence of such extreme dullness, however, there is a natural tendency for the market to sag, which disposition, however, may soon be erased by the occurrence of increased business. In the meantime new orders, though small, are being only secured by a sacrifice of, or rather by concessions in, prices. No. 3 Foundry and Mottled Iron show most weakness. At the same time, there is no pressure to sell round lots by either Southern or Northern stacks, although there is an indication of increased stocks. Producers adhere to their belief of an improved market during the latter part of the year, and the financially strong furnaces can well afford to wait for the favorable turn. With others, however, it may be a matter of necessity, but, apparently, all are inclined to sell as little as possible. On the other hand, buyers meet with little encouragement to make large purchases, and even when covering present wants they succeed in drawing the seller to them rather than otherwise, which gives them some advantage. Forge Iron continues to show less relative weakness than Foundry grades, but Mottled Iron has been sold lower. Car-Wheel Iron, too, is lagging, especially the lower numbers. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.50 @ 14.00

Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.

Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.50
Gray Forge.....	13.00 @

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

Manufactured Iron.—The only feature of prominence has continued to be dullness, but there has been no change in prices.

Nails.—There has been an increased demand at the lower prices current. 12d @ 40d sell at \$1.90 @ \$1.95 $\frac{3}{4}$ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50 $\frac{3}{4}$ keg.

Old Material.—There has been very little trading in the local market in either Rails or Wheels, and while there is no pressure to sell there are no importunate buyers. Old Rails are quotable at \$20 @ \$20.50 and Old Wheels at \$18 @ \$18.50 per ton, spot cash.

Messrs. Talbott & Lupton, Iron and Steel factors, with offices at Nos. 1 and 2 Wiggins Block, announce that they will on May 1 remove to No. 8 of the same block, where they will have much more commodious quarters. They also invite attention to the fact that they are special representatives of the Roberts Wire Company, Belmont Nail Company and Hartman Mfg. Company.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 22, 1889.

Pig Iron.—While prices are low, Iron is certainly not a drug in the market. It is true that there is some piling up of stock at the yards, but nearly all the furnaces whose Iron has a reputation are disposing of their output at prices that are paying them some profit; and there is no intimation so far of any of them shutting down. Three large stacks in this district are out for the purpose of relining, but which, as soon as completed, will again go in, with a greater output than ever. There is much difficulty in getting an expression from furnace owners as to the future; and the probability is that but few of them have any opinion to express—only that they all intend to keep pegging away as long as they can get a dollar or two profit on a ton, which most of them say they can still do. Within the past few days there has been quite a disposition on the part of speculators to again enter the field, and quite a number of round lots are being piled up at the furnace yards. This no doubt gives an appearance of the furnaces piling up more Iron than they really are. Two of the Sheffield stacks have again gone in blast, and they state they have enough placed to go on for some two or three months at figures that are remunerative. The owners of the new plants that have been projected within the past few months, some of which have been commenced, are still sanguine of the future of the Pig-Iron industry of the South, and continue to put in their money; and they are going steadily forward in their construction, the owners arguing that there never was a cheaper time than now for the construction of such works, which is no doubt correct. The market is ruling at \$13 @ \$13.50 for favorite brands of No. 1 Foundry and \$12 @ \$12.50 for No. 2, in round lots, and about 75¢ higher for car lots.

Louisville.

LOUISVILLE, KY., April 22, 1889.

Pig Iron.—The market has been quiet during the last week, with very little doing. Buyers of Iron have largely laid in supplies for the future. Offerings have not been heavy, as most of the furnaces have made contracts for several months ahead. The blowing out of one or two Southern furnaces somewhat relieves the pressure of the balance to sell. It, however, has not resulted in any increase in prices, as offerings are low and it is not generally anticipated that much improvement will occur in the immediate future. Prices remain about the same:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
" " No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

Macfarlane & Mordue, of Louisville, Ky., successors to Kent, Macfarlane & Mordue, have now completed their arrangements for conducting a storage business in Pig Iron. Their yard is 150 feet front and 400 feet deep, situated on the line of the Louisville and Nashville Railroad, and enjoys the best switching facilities. Sheds and bins have been erected for the unloading and assorting of Scrap Iron, while the balance of the yard is used for the storage of Pig Iron. Two side-tracks extend into the yard, on which 20 cars can be accommodated, and Pig Iron can be unloaded or loaded from either side of them. Negotiable warehouse receipts are issued on all the material stored in the yard. Quite a quantity of Pig Iron has already been received on storage and a large lot of old car-wheels. The owners of the yard will in the near future put in machinery for cutting up old rails and scrap. Their city office is located in the Kenyon Building.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, April 24, 1889.

The strike at the new Rail mill of the Allegheny Bessemer Steel Company still holds out, but thus far there has been no serious trouble, and the company have invoked the aid of the proper authorities, so that there is not likely to be any. It is evidently the intention of the company to make the mill non-union. Two of the leading spirits in the mill, Messrs. Park and Clarke, are at the head of non-union mills, the former with the Black Diamond Steel Works and the latter with the Solar Iron Works, both of which are operated by non-union men. It is, therefore, as already stated, the intention of the management of the new mill to make it non-union, and as they have had considerable experience in the way of strikes they have not gone into it unadvisedly or without counting the cost.

Some of the Monongahela River coal works have shut down, and it is expected that there will be a pretty general suspension within the next few weeks. All the down-river markets are overstocked, and not for years has the river coal trade of Pittsburgh been in as depressed a condition as at present.

The Iron wage scale is now renewed on the 1st of July instead of the 1st of June, as was always the time for adjustment until within the past year or so. Mill owners say they must have a reduction in order to compete with the cost where

skilled labor is so much cheaper; this will doubtless be resisted by the Amalgamated Association, and it is difficult to foretell what the outcome will be. As stated several weeks ago, some of the iron-workers favor a general shut down for a couple of the hot months, July and August, but whether mill owners will agree to this remains to be seen.

Pig Iron.—Dullness still rules, and, while hopes are entertained of an early improvement, the outlook in some respects is not as encouraging as it might be. Brokers say that not for years have they known business to be so dull at this season of the year. Some of our oldest furnace agents did not enter a single sale on their books during the week; and they are making but little effort to sell under present conditions. We understand that offers have been made to buy good brands of Gray Forge at \$14, cash, but thus far no sellers can be found under \$14.25, cash. Foundry Irons continue very dull, and there does not appear to be as much inquiry for Bessemer as there was a few weeks ago. Quotations may be fairly made as follows:

Neutral Gray Forge.....	14.00 @ \$14.25, cash
All-Ore Mill.....	15.25 @ 15.75, "
White and Mottled.....	13.00 @ 13.50, "
No. 1 Foundry.....	16.50 @ 17.00, "
No. 2 Foundry.....	15.50 @ 16.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	24.00 @ 27.00, "
Bessemer Iron.....	16.00 @ 16.50, "

Spiegel—Is quoted at \$29.50 @ \$30, cash, for 20 %, and Ferromanganese \$58 @ \$58.50 for 80 %.

Muck Bar.—There is some inquiry, but the market continues weak; we are advised of sales at \$26 @ \$26.50, cash, but few sellers as yet under \$26.50, cash. Makers claim that under the most favorable circumstances it is difficult to more than get a new dollar for an old one, and that if they happen to meet with an accident to their machinery they are out of pocket.

Manufactured Iron.—There is but little change to note in the condition of the market for Merchant Iron; demand continues light for the season, and prices are unsettled and unsatisfactory. We continue to quote upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash. Old-Rail Iron, it is said, is being sold by Mahoning Valley mills upon a basis of 1.50¢ for Bars. Skelp Iron, on which several of the mills are running full (one of them reports having orders booked sufficient to keep it busy until the 1st of July), is still quoted at 1.65¢ for Grooved and 1.90¢ for Sheared.

Nails.—There is no improvement to note in the Nail trade, and apparently but little prospect of any; only two concerns in Pittsburgh are paying any attention to Nails, and they are not working half time. We continue to quote full card rates, but it is possible that for a desirable order, of which there are very few offering, concessions would be made. It is reported from Wheeling that the Nail trade there is just as poor as it is here, and that an effort is being made there to have the wage scale reduced. Carnegie, Phipps & Co. are reported as pushing the Wire-Nail trade with considerable vigor, and there is no disputing that the Wire is to a considerable extent supplanting the Cut Nail throughout the whole country.

Wrought-Iron Pipe.—There is still considerable activity in large-size Pipe, and some of the mills have all they can do, but the smaller sizes continue very dull. The Standard Oil Company have placed some large orders within the past few weeks, and it is to be hoped that other buyers will make their appearance before long. The combination prices are being faithfully adhered to, which to manufacturers is encouraging. It may be stated that the combination rates are low enough,

and one object in keeping them low was that there would be less temptation to cut. Discounts on Black Butt-Welded Pipe 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Tubes, for 2 to 2½ inch, inclusive, 62½ % off; Casing, 5½-inch, 62½ % off; other sizes, 60 % off; 2-inch Tubing, 13¢ per foot, net; 3-inch Line-Pipe, 20¢ per foot; 6-inch do., 53¢; 8-inch, 90¢.

Old Rails.—Continue dull and prices are weak and drooping; sales of 650 tons reported at \$22.50 for American. There are but few offering, but the demand is light. Old Steel Rails are in fair request; Short Lengths quotable at \$17.50; Sale, 200 tons main track, long lengths, at \$20.

Steel Rails.—Heavy Sections are still quoted at \$26.50 @ \$27.50, cash, at mill, according to size of order, delivery, &c. The mill of the Allegheny Bessemer Steel Company, as noted elsewhere, is stopped in consequence of the men being on a strike.

Railway Track Supplies.—No change in prices. Spikes, 2¢, 30 days, f.o.b. cars at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Billets, Blooms, &c.—Bessemer Steel Billets and Blooms are still quoted at \$27 @ \$27.50, cash, according to size, quality and delivery. Domestic Bloom and Crop Ends may be quoted at \$17.50 @ \$18.

Old Material.—Continues dull, hardly enough doing to establish prices. No. 1 Wrought Scrap, \$19, net ton; Wrought Turnings, \$13; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14 @ \$14.50, gross; Cast Borings, \$11 @ \$12; Old Car-Wheels, \$19.

Detroit.

WILLIAM F. JARVIS & Co., under date of April 22, 1889, report as follows: While the market for the past week has been by no means dull, yet there seems to be a somewhat undecided feeling among buyers. Although stocks in consumers' yards are in most cases quite small, orders are placed only for limited quantities and for reasonably prompt shipment. Lake Superior Charcoal continues in fair demand, and some good sales of special brands have been made. Southern Irons are being offered at very low figures, and certain brands of Ohio Coke Irons are offered below prices asked three weeks ago. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.50 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.50 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, April 24, 1889.

American Pig.—The majority of sales agents and commission merchants report the market dull and, generally speaking, in an unsatisfactory condition. Current business is light, though in the aggregate it is up to that of last year. Consumers, however, are not buying more than to cover early requirements, and concessions would not apparently tempt them. Southern Irons are offering at \$16.75 @ \$17 for some brands, and it is probable that for some desirable orders lower figures would be accepted. We quote Northern standard brands \$17.50 @ \$18 for No. 1, \$16.25 @ \$17 for No. 2 and \$15 @ \$15.25 for Gray Forge. The latter would not probably fetch the lower price if any effort were made to press it for sale.

Scotch Pig.—The market is exceedingly dull, high cost making it difficult to

sell below our nominal quotations: Coltness, \$21.50 @ \$21.75; Summerlee, \$21.25 @ \$21.50; Langloan, \$21, and Dalmellington, \$20 @ \$20.50. Mahoning Valley Scotch can be laid down here at \$19.50 @ \$20, and deserves, as it is given, the preference.

Spiegeleisen and Ferromanganese.—The market is quiet. A block of 5000 tons of 20 % German Spiegeleisen has been offered at \$27.50 and could probably be bought at less. A lot of a little less than 1000 tons of Domestic 20 % Spiegel has been sold at \$27.75 at furnace. We quote Ferro. \$56 @ \$56.50, ex ship.

Foreign Ore.—The market is very quiet, little business being done, except an occasional cargo of Ore for the manufacture of Special Low-Phosphorus Pig. Such Ores as the Elba and Marbella sell at about 11¢ per unit. Freighters are a little lower, say 15/6 from Elba, and 14 @ 14/6 from other Mediterranean and Peninsula ports.

Structural Iron and Steel.—A number of contracts for large buildings in this city are in the market. We continue to quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

Plates.—One of the leading mills in the Pittsburgh district has withdrawn from the market at present prices. Other sellers are still very eager for business, however. Thus Steel Tank Plates have sold recently, for a moderate lot, at 2.15¢, delivered. We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

Bar Iron.—For large lots, Common is being offered at 1.55¢, delivered. The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

Hoops.—We note a sale by a mill in Central Pennsylvania of 1000 tons of Iron Hoops at private terms. We are informed, however, that the price was lower than Foreign Steel Hoops can be laid down for; although the latter are still lower than the domestic article.

Steel Rails.—Sales by Eastern mills have been confined to a few moderate-sized lots, among them one of about 5,000 tons to a Southern road, Savannah delivery, at a shade under \$27 at mill. In the West a Pittsburgh mill has secured the Louisville and Nashville contract of 15,500 tons at private terms, for delivery till May, 1890. We note also a sale of 1000 tons delivered at East St. Louis at \$29.25. There is some Southern business in the market, aggregating about 20,000 tons, including a 12,000-ton lot, which can probably be best reached by one of the Pittsburgh mills. We continue to quote \$27 @ \$27.50 at Eastern mill for fair-sized orders.

Old Rails.—Among the transactions reported is a sale of 1700 tons by an Eastern road to a Spike mill at \$22, New Haven. It is stated, however, that this price was paid as an inducement to secure an order for 2000 kegs of Spikes for the road selling the old material. We note also the sale of a few hundred tons of Old Rails to a Virginia mill at \$22 delivered, which it is reported netted the railroad about \$19, deducting freight. We quote \$22.50 @ \$23, nominally.

Scrap Iron.—This market is featureless and dull. Buyers' ideas of prices do not quite come up to those of sellers, who are accumulating stocks rather than make the concessions necessary to effect sales. Prices are firm at about the following figures: No. 1 Scrap, \$20.50 @ \$21.50,

for carload lots, delivered; Turnings, \$13 @ \$13.50, do.; Cast Scrap, \$15.50 @ \$16, do., Cast Borings, \$9.50 @ \$10.

Rail Fastenings.—The market is weak and quiet, with Spikes selling, delivered, in normal lots at \$1.95 @ \$2 and Angle Plates at \$1.75 @ \$1.80.

Cotton Ties.—Business is quite active, with prices at \$1.10 @ 40-lb bundle, New Orleans delivery.

H. L. Waterman, Mills Building, is now the agent for the products of the Hartman Works of Carnegie, Phipps & Co., viz.: Cold Die-Rolled Steel, Merchant Steel, Steel Wire Nails and Copper Wire.

Financial.

Centennial preparations and the Easter holidays have diverted attention from business to some extent, and among certain classes of traders the absence of expected buyers is interpreted as meaning that customers have deferred their movements in order to take advantage of low fares fixed for centennial visitors. It looks as if the first three days of next week are to be close holidays so far as this city is concerned. From one cause or another business does not altogether meet expectations, particularly as to the profits realized. Accounts from a distance indicate a seasonable increase of business at many points, although at Chicago "a particularly economical feeling" is said to exist in agricultural sections. The situation in Chicago, according to the *Inter-Ocean*, shows that "general business is unusually active in the city and the country tributary to that market. At St. Paul sales are said to be largely in excess of those of last year, the season being nearly three weeks earlier. Improvement in the lake regions will be more decided when advantage can be taken of lower rates for freight. Clearing-House returns from forty-two cities show an aggregate increase of 8.8 % compared with last year. In New York the gain is 8.3 %; outside of New York, 11.7 %. Boston gains 14.9 %. San Francisco, 11.9 %; Cincinnati, 4.2 %; Pittsburgh, 17.8 %; New Orleans, 20.4 %; Louisville, 24.1 %. Philadelphia, St. Louis and Baltimore decline moderately. The most important development of the week is the decision of the Interstate Commerce Commission, holding the Canadian roads strictly amenable to the Interstate law. As the provisions of the law can be enforced by a suspension of the privilege of transporting goods out of and into the United States again in bond, it is reasoned that the last grievance the railroads had against the Interstate law has disappeared. Crop accounts are good. Rains have fallen in all parts of the spring-wheat sections in the Northwest. A reduction of 50 % in freight rates between New York and Mexico has been made by the railroads from this city, making rates 65¢ @ 100 lb, against \$1.30 previously. Colonel Erhardt, the new Collector of this port, will assume the functions of the office on May 5.

The Stock Exchange markets were moderately active, transactions being confined to professional traders. The future course of prices is discussed with a wide variance of opinion. The very favorable bank statement had no influence. One feature was a fall in Hocking Valley, due to the bad condition of the soft coal trade. The volume of business done on the Stock Exchange on Tuesday was small, and as a rule prices moved within a narrow range. The interest of the day is centered in sugar trusts, gas trusts, Union Pacific and the stocks of other roads in the last-named system. The trust shares were quite active and displayed considerable irregularity. Union Pacific was sold by local interests,

but was bought by the foreign houses to a good aggregate amount. The bond market was a feature, particularly Reading generals.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	108
U. S. 4½s, 1891, coupon.....	108
U. S. 4s, 1907, registered.....	120½
U. S. 4s, 1907, coupon.....	120½
U. S. currency 6s.....	121

The weekly statement of the Associated Banks showed a large increase in reserve, amounting to \$6,021,100, or 50 % larger than the week previous. This makes the surplus reserve now held \$12,067,210, against only about \$1,409,000 a fortnight ago. In loans there was a contraction of \$549,200. Specie increased \$6,537,300, and legal tenders \$1,106,600; deposits, \$6,491,200. The operations of the banks with the Sub-Treasury were the chief source of gain, amounting to about \$4,500,000. The currency movement was also in favor of the local banks. The extreme ease of money here and in Europe has stimulated purchases of lands by investors. The inquiry for short-time loans was insignificant, and the demand for longer dates was promptly met, the result being shown in the comparatively low rates of 3 % for 60 to 90 days; 3½ for four months, and 4 for from five to eight months. Commercial paper is in good demand and the supply is only fair. Rates are 4 to 4½ % for 60 to 90 day indorsed bills receivable.

The President appointed E. S. Lacey, a practical banker of Charlotte, Mich., to be Comptroller of the Currency. Exports of specie for the week amounted to \$692,000 and the imports to \$227,000.

The market for sterling is dull. The Bank of England rate was reduced from 3 % to 2½ %. The posted rates in New York are \$4.87½ @ \$4.89½. The liquidator of the Panama Canal Company made an unsuccessful attempt to borrow \$3,000,000 in London for the expenses of a survey and the maintenance of the canal works. His failure implies that within a few weeks the machinery along the canal will be abandoned.

The prices of commodities, excepting sugar and cotton, continue to droop. Breadstuffs were weak and lower again, on the influence of fair weather West and a month earlier wheat harvest than a year ago, according to advices from the Southwest, and as indicated by the heading out of the winter crop. This depressed the market daily, and even the visible supply decrease had no effect to rally the market. Corn was firm, on temporary scarcity, caused by the fire at the New York Central elevators, checking export demand. The export movement of provisions continues to be largely in excess of last year's. There is still an absence of inquiry for grain vessels to load at Atlantic ports. Sugar and cotton are higher. Coal is depressed. The Department of State is informed that the Canadian Government has continued the special rates of last year on the Welland Canal business.

The imports of merchandise at this port during the week were valued at \$9,083,000, of which about \$2,200,000 represents dry goods. Since January 1 the total is \$159,458,000, against \$155,433,000 for the same time last year.

The certificate of incorporation of the Edison General Electric Company was filed by Henry Villard and Thomas A. Edison and associates to carry out arrangements for consolidating the Edison Electric Light and Mfg. Companies. The capital stock of the company is \$12,000,000.

The Bureau of Statistics reports exports of breadstuffs for March to have been \$9,636,482, an increase of about \$350,000 over the exports for March, 1888. The total exports of beef and hog products for

March were \$8,125,068—an increase of nearly \$3,000,000. The exports for the five months ending March 31 were \$41,571,715—an increase of \$9,000,000 over the exports for the corresponding period of the last fiscal year. It is worth noticing that in exports of lard alone there was an increase during the month of over \$1,000,000 worth, and during the five months an increase of nearly \$4,000,000.

Metal Market.

Copper.—Spot Copper declined in London since our last week's report from £37. 5/ to £36. 17/6 yesterday, and futures from £37. 10/ to £37. 5/; sales 1500 tons. One dispatch was received from Boston stating that in their negotiations with the parties in Europe the American representatives desired to fix the price of the metal at from £40 to £45, while the Rio Tinto people want it to be £35, and the bankers desire as much as £50; furthermore, that there are hopes of having the accumulated stock held for six months and the output curtailed. Another dispatch (from Paris, April 17) speaks of a stormy discussion that took place between the representatives of the Copper mines resident in London and a banking firm of high standing. The Bank of France, the Credit Foncier and Baron Hirsch are said to hold jointly 40,000 tons, the Banque de Paris 20,000, and other firms 50,000, and that the general public is of opinion such stocks cannot be realized except at a loss to the holders. A third message (Paris, April 19) announces that the shareholders of the Comptoir d'Escompte have filed the necessary number of shares to enable them to agree on a resolution legal in its effects at the general meeting to come off on April 29. Meanwhile, M. Moreau, the liquidator of the said bank, has proceeded to London in order to make an effort to get the same released from the guarantees given to English and American mines in support of the collapsed Société des Métaux. M. Moreau bases his hopes upon the decision of the Supreme Court in the "Terrenoire Iron case" years ago. He thinks the present case of the Comptoir d'Escompte guarantees is identical with the Terrenoire case. Nothing has occurred in our own market pending these steps taken in Europe. Nothing has been sold in the open market of Lake Copper; casting brands are obtainable at 12½¢ @ 13¢. Electrolytic, guaranteed quality, has sold at 13¢. Parties interested in England have subscribed a couple of thousand pounds sterling to pursue the Comptoir d'Escompte directors and those of the syndicate personally.

Tin.—London improved for the week from £91. 15/ to £92. 12/6 yesterday, and futures from £92. 15/ to £93. 5/; sales 200 tons. The consumptive inquiry being light in our own market, and but little speculative inclination extant, sales were confined to a few small lots, 10 tons May, at 20.65¢, and 10 September, at 20¼¢, spot ruling toward the close at 20¼¢ @ 21¢, April being offered at 20.90¢, and May at 20.80¢, with 20.65¢ offered for both. The closing price of spot Tin in the open market is 20¼¢ @ 21¢ at noon to-day. At the Metal Exchange to-day 25 tons July, 25 tons August and 25 tons September sold at 20¼¢. Dealings outside of the exchange are active, the large metal firms having sold considerable quantities of Tin, chiefly for shipment. One leading concern has averaged in its sales about 25 tons of Tin per day. **Tin Plates.**—The Tin-Plate market has been sharing in the general dullness in metals, but, as stocks are light, and the markets abroad remain very firm, there is no giving way in prices. We quote,

large lines, ordinary brands, $\frac{3}{4}$ box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

Lead.—Some 250 tons Common Domestic were sold at 3.67 $\frac{1}{2}$ ¢, and 50 tons later on at 3 $\frac{1}{2}$ ¢, the closing figure being 3.65¢, at which the market winds up languid, with hardly any disposition shown by consumers to stock up, as they have secured, it would seem, a sufficient supply to meet their next month's requirements. The West is flat at 3.40¢. At the Metal Exchange to-day 50 tons spot brought 3.65¢.

Spelter.—Has been quiet at 4.65¢ for Common Domestic, and Silesian at 5 $\frac{1}{2}$ ¢ @ 5 $\frac{3}{4}$ ¢ nominally. The spring demand is evidently slow in coming forward. The metal is meanwhile devoid of features either way.

Antimony.—Has continued moving off steadily in a jobbing way at 12¢ Hallett and 13 $\frac{1}{2}$ ¢ Cookson.

New York Metal Exchange.

The following sales are reported:

THURSDAY, April 18.	
10 tons Tin, May	20.65¢
WEDNESDAY, April 24.	
25 tons Tin, July	20.75¢
50 tons Tin, August	20.75¢
25 tons Tin, September	20.75¢

Coal Market.

The Anthracite Coal market is dull, with no alleviating features. The situation was the subject of a conference last week, with no further result than talk about advancing prices in June, but meanwhile circumstances bearing on the subject may naturally change. Cut rates among individual operators are quoted, and it is openly charged that prices are shaded by some of the larger companies. Production is still in excess of demands despite the efforts to restrict. The total exported for the week is 543,788 tons, against 506,662 for the previous week, and for the year since January 1, 8,391,700 tons, as compared with 9,809,700 for the same time last year. The official statement shows an output for March of 2,103,062 tons, as against 2,685,728 tons in the same month last year. Demands for manufacturing are on a lessened scale. Among recent contracts the following are reported: Supplies for the New York Board of Education, Talbot & Phillips, Staten Island Rapid Transit Road, Ward & Olyphant, Boston and Marine Railroad Company, Berwind-White Coal Mining Company. The West Point contract was awarded to Swords & Dickson at the following prices and discharge: Stove, \$4.28; Chestnut, \$4.23; Egg, \$4.03. The New Haven contract was divided between the Berwind-White Company, Pocahontas, Sterling Coal Company and J. C. Scott & Sons, at prices stated to be less than last year's.

There is a better inquiry for Coal at Eastern ports. The Connellsville, Pa., *Courier* says: "The Coke trade continues to fluctuate. Production and shipments still vary from week to week, but the general average is dropping slowly and steadily downward. Production for the past three months shows a steady decline. Shipments have fluctuated more, and the daily average for March is slightly in excess of that for February, though the production is *vice versa*. There does not seem to be any assurance of an improvement in the situation before fall, if then."

The Pennsylvania Railroad Company have begun the shipment of Coal from Harsimus Cove, opposite New York City.

The Delaware and Hudson Coal Company are to erect steam elevators on new docks building in deep water near Rondout Creek.

The Pennsylvania Railroad transported 200,000 tons of Coal during the week ended April 13, and the Reading reports 25,000 tons shipped to Port Richmond and Port Liberty during the week ended 20th inst.

Imports.

Hardware, Machinery, &c.

Auffmordt, C. A., Mach'y, cs., 3
Batram Bros., Mach'y, pgs., 4
Boker, Hermann & Co., Mdse., cs., 4; Arms, cs., 28
Clark, G. A. & Bro., Mach'y, cs., 287
Corbiere, Fellows & Co., Mach'y, pgs., 28
De Witt Wire Mfg. Co., Mdse., cs., 6
Erie Dispatch Co., Mach'y, cs., 22
Field, Alfred & Co., Mdse., cs., 5; Anvils, 75; Hardware, cs., 15
Folsom, H. & D., Arms Co., Guns, cs., 7
Graef Cutlery Co., Cutlery, cs., 7
Jones, Charles, Hardware, pgs., 10
Marshall & Co., Mach'y, cs., 3
Munoz & Espriella, Mach'y, cs., 7
Moseman, C. M. & Bros., Horse Clippers, case, 1
Oastler, W. C., Mach'y, case, 1
Overton & Co., Mach'y, cs., 5
Pratt & Farmer, Hdw., cs., 10
Schoverbing, Daly & Co., Arms, cs., 3
Sheldon, G. W. & Co., Mach'y, pgs., 19; Ironware, cs., 12
Sanderson & Son, Mach'y, pgs. and pgs., 42
Taylor, Thos., Mdse., cs., 13
Terkile, J., Iron Signs, cs., 29
The Traders' Dispatch, Mach'y, cs., 15
Wyman, Chas. & Co., Arms, cs., 12
Ward, Jas. E. & Co., Stoves, 150
Wright, Peter & Co., Machine parts, pgs., 52
Wiebusch & Hilger, Lim., Mdse., cs., 49; Hwd., pgs., 14; Arms, cs., 5
Williams & Whitney, Anvils, 28
Witte, John G. & Bro., Cutlery, cs., 12; Needles, case, 1
Orser.—Mach'y, tons, 8; Guns, cs., 20; Mach'y, cs., 50; Hardware, cs., 6

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	1.08
Milreis (Brazil)	54.3
Mark (Germany)	23.3
Kilogram	2.205
Picul	134

EAST INDIES.

PENANG, March 5, 1889.—Tin.—Receipts for the fortnight amounted to 5500 piculs. Europeans bought 2000 piculs, for the most part from Chinese dealers, who, besides, secured 7000 piculs. The market rose from \$36 to \$37.25, in order to close at \$36.70. During the first two months shipments to England summed up 22,493 piculs, against respectively 53,725 and 21,643 the previous two years. To the Continent there have been no shipments, but to the United States they were respectively 3112, 425 and 5467. *Exchange*, 3/0%.—*Schmidt, Kustermann & Co.*

SINGAPORE, March 12, 1889.—Tin.—Since the 26th ult. business has been very restricted. Small arrivals and a falling market in London have resulted in but a small business being done. The market opened at \$36.50, advanced to \$37.25, but closes weak again at \$36.25, sellers, but no buyers. This month's export will be moderate, and it is expected that the arrivals for some time will be on a more limited scale than they have been of late. *Gum Copal.*—The daily arrivals have fetched good prices, but in old stocks, which are large, there has been nothing done. *Gum Dammar.*—Palembang of low quality fetched \$20.50 $\frac{1}{2}$ picul. *Tonnage.*—Still more room offers from China, and rates per steamer to London gave way to 35/ for dead weight. *New York via Cape.*—The Edward Kidder has arrived, and will take up her engagements. *For Boston.*—The berth is vacant. *Exchange* has declined to 3/1 $\frac{1}{2}$ for six months' sight credit drafts. The exportation of tin from the Straits Settlements to the United States during the first two months has been 22,230 piculs, against 9846 in 1888, 12,866 in 1887, 14,715 in 1886, 4205 in 1885 and 9841 in 1884. The Dardanus took hence for New York 842 piculs, the Gulf of Guinea 1262 from Singapore and the Shannon, from here, 2843.—*Gillilan, Wood & Co.*

MANILA, April 15, 1889.—Hemp.—Has been nominal at \$13.50 $\frac{1}{2}$ picul, against same date last year \$8.44, equaling $\frac{1}{2}$ ton, cost and freight, \$45.12/6, against \$30.2/6. The clearances for the United States since January 1 amount to 105,000 bales, against 43,000 in 1888; there remain loading for ditto 11,000, against 24,000;

there cleared for England since January 1 85,000, against 100,000, while there remain loading 3000, against 1000. Cleared for all other ports, 11,000, against 24,000; receipts at all ports since last cable, 14,000 bales, against 19,000, and since January 1, 200,000 bales, against 176,000 last year and 132,000 in 1887. *Freight*, \$7.50, against \$5. *Exchange*, six months' sight, 3/7, against 3/8.—*Ker & Co., per cable direct to their agent, Mr. Charles Nordhaus, 89 Water street, New York.*

COLOMBO, March 7, 1889.—Plumbago.—Business has been limited to a moderate export demand at the following quotations in rupees $\frac{1}{2}$ ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Shipments since October have been as follows: To England, 54,901 cwt.; to Hamburg, 5418; to Antwerp, 5101; to Bremen, 659; to Holland, 437; to India, 63; to Australia, 88, and to the United States, 58,580; together 125,247 cwt., against 114,527 in 1888, 102,284 in 1887 and 81,546 in 1886. *Coir Yarn.*—Nos. 1 to 4 have brought 7 @ 12 rupees $\frac{1}{2}$ cwt. *Exchange*, six months' sight, 1/4 $\frac{1}{2}$.—*Volkart Bros. to their agent, Mr. John W. Greene, 82 Wall street, New York.*

AUSTRALIA.

MELBOURNE, Victoria, March 28, 1889.—Iron.—Although buyers have been holding back somewhat, more has been done, the inland trade being brisk. No. 26 Galvanized Iron brought £17.12/6; No. 8 Fence Wire, £8.15/. *Tin.*—Shipments from Australia and Tasmania footed up 375 tons for the fortnight.—*Per cable via London.*

GERMANY.

HAMBURG, April 13, 1889.—Iron.—The demand for Pig Iron remains so brisk in Rhenish Westphalia, with appearances of permanency, that more blast furnaces are contemplated; it is to be hoped that this may not eventually lead to overproduction. Spiegel has continued active and steady at 63. Forge Pig is without difficulty bringing 56.50 marks $\frac{1}{2}$ ton; orders have been booked to October 1. Foundry Pig is moderately active. Bessemer is least wanted, at 58 @ 59; English do., 48/ on the West Coast. Both Thomas and Luxembourg have been sustained. Finished Iron is all the brisker since to the great home demand some for export is now added. Beams, though selling very well, begin to be turned out at such a rate that a reaction may sooner or later be unavoidable. Both Plates and Sheets keep up the same degree of liveliness, though advanced in price. The Wire branch has not yet recovered last year's activity. Cast-Iron Pipe foundries have now come to an understanding, so that there is an end to the ruinously low figures. Steel Rails have been sold to the Roumanian railroads at 102 marks $\frac{1}{2}$ ton, delivered at Galatz; at home they are bringing 120 @ 125. The Dortmund quotations for Beams are 125 @ 128; Mild Steel and Bessemer, 145; Wire Rods, 114 @ 120; Steel Rails for mines, 110 @ 115.—*Borsenhalle.*

BELGIUM.

BRUSSELS, April 13, 1889.—Iron.—Opinions are divided about the desirability, from a general point of view, of the suppression of the import duty on Pig Iron; hence it is as yet doubtful whether the measure will pass. The Government collected for such duty last year 437,145 francs. In the Finished-Iron trade orders are being received at such a rate that it may be decided to raise prices. A good many of these orders are for export. As matters stand, the general outlook in the Iron trade is decidedly encouraging, the spring trade having set in earlier and with greater vigor than usual, with indications that the demand will not abate much in the summer.—*Moniteur des Interets Matériels.*

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 24, 1889.

The metal markets have been quiet during the past week, partly because of the Easter holidays and partly owing to the absence of incentive to speculation. Block Tin, which sold at as low as £91.10/ last week under pressure to realize, has reacted about £1, and now that the pressure is withdrawn the market is firmer, although quiet.

A considerable amount of Copper has changed hands at declining prices, with as low as £36.15/ taken for Merchant

Bars. The purchases were principally by large speculators, there being little business with consumers. Holders continue to gradually realize.

The demand for Tin Plate has been less active, and prices have shown a drooping tendency the past few days. Makers, however, are in expectation of large orders soon, and yield very little, in view of the strong Iron market.

Business in all branches of the Iron and Steel trade has been moderate, owing chiefly to the holidays, but is showing more spirit at the close. Prices for common Sheets have advanced 5/8 ton, and 2/6 advance is asked for Blooms, Billets and Slabs.

Scotch Pig.—Business moderate the greater part of the week, but more active to-day. Prices are somewhat irregular.

No. 1 Coltness, f.o.b. Glasgow	56/
No. 1 Summerlee, " "	55/9
No. 1 Gartsherrie, " "	52/6
No. 1 Langloan, " "	55/9
No. 1 Carnbroe, " "	47/6
No. 1 Shotts, " at Leith	55/6
No. 1 Gtongarnock, " Ardrossan	52/
No. 1 Dalmeilington, " "	46/
No. 1 Eglinton, " "	45/
Steamer freights, Glasgow to New York, 2/6;	
Liverpool to New York, 10/.	

Cleveland Pig.—Trade rather slow in this branch, but the market very firm. No. 3 Middlesborough, G.M.B., 39/ prompt.

Bessemer Pig.—Quite large sales since the holidays, and prices strong at 1/ advance. West Coast brands, mixed numbers, 50/, f.o.b. shipping point.

Spiegeleisen.—There is a fairly good demand and prices remain firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—The market continues strong and inquiries are more numerous. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

Steel Blooms.—More demand for these and higher prices asked. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand good. Makers offer sparingly and ask higher prices. Bessemer, 2½ x 2½ inch, £4. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Sales moderate but prices very firm and held higher. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—There is no improvement in the demand, and prices are nominal. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap Iron.—Small sales making at previous prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Tin Plate.—The demand is irregular. Prices are showing little change. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer Steel, Coke finish	13/6 @ 14/
IC Siemens " "	14/ @ 14/6
IC Coke, B. V. grade	13/ @ 13/3
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—The demand has been brisk and prices are strong. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
" Common " "	@ 5 17 6
Staff. Bl'k Sheet, singles	@ 7 15 0
Welsh Bars (f.o.b. Wales)	5 2 6 @ 5 5 0

Crop Ends.—The market firm but rather slow. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Copper.—There has been a fair business. The market barely steady. To-day's prices for Bars were £36. 12/6, spot; £37, three-months' futures. Best Selected, £45.

Tin.—The demand for consumption fairly active and prices firmer. Straits sold at £92. 10/, spot, and £93. 5/ for three months' futures.

Lead.—More doing in this metal, but prices show no material change. Quoted £12. 15/ for Soft Spanish.

Spelter.—The demand only fair, but prices firm. Quoted at £17. 12/6 for ordinary Silesian.

On Tuesday 18 non-union colored men were about to go to work at the Allegheny Bessemer Steel Works, where a strike is in progress, but were intimidated by a display of pistols and induced to leave.

Important changes have taken place in the management of the Tennessee Coal, Iron and Railroad Company. Judge Bond, until recently connected with Decatur enterprises, has become general manager. Fred. W. Gordon has charge of the furnace properties and is now pushing the Ensley plant. H. Duncan Wood & Co. are the fiscal agents in New York. It is probable that influential New York capitalists will take a large interest in the concern, whose policy will be considerably modified. The first effort is to be in the direction of improving furnace work, bettering quality and marketing product in a more conservative manner. It is probable that the company will first endeavor to accumulate earnings to create a large working capital. It has been suggested also that the Linn Iron Works, at Birmingham, be transferred to Ensley, the real estate being very valuable.

The Philadelphia Company have made a series of meter tests to show the consumption of natural gas in puddling in the McSweeney regenerative furnace, as compared with that of the common puddling furnace:

Style of furnace.	No. of heats.	Material.		Gas used per 240 pounds of muck produced actually working.	Gas used per 240 pounds of muck produced through whole time.
		Charged pig.	Produced muck.		
Common, A.	55	27,500	27,095	34,109	
Common, A.	30	15,000	15,031	23,618	
McSweeney's, I.	55	27,500	27,525	14,829	19,079
McSweeney's, I.	55	27,500	27,125	13,529	
Common, B.	86		42,130	30,000	53,650
McSweeney's, J.	85	26,400	26,129	15,952	21,535
McSweeney's, J.	52	24,000	24,099	12,100	18,390
Common, C.	55	28,875	28,725		36,958
McSweeney's, K.	55	28,875	28,130	13,719	
McSweeney's, K.	55	28,875	27,885		14,746
McSweeney's, K.	55	28,875	27,980		13,861
Common, D.	50	25,000	24,325	38,996	53,850
Common, E.	27	20,250	20,765	24,450	35,216
Common, F.	55	27,500	26,888	34,589	48,144
Common, G.	47	25,500	23,480	37,972	40,811

The trials were made at different times between December, 1887, and March, 1888. The Philadelphia Company own the right to use the McSweeney furnace in Allegheny County and are offering the use of the devices to all their customers.

The National Tube Works Company, McKeesport, Pa., report that they have sold over \$8,000,000 worth of their kalamined pipe since the patents were issued. This pipe is used for a variety of purposes, principally water, oil and gas. There are 5900 men at present in the employ of the above company, and their works comprise 60 acres under cover. The

daily output is 1000 tons of finished product, including standard steam, gas and water pipe, boiler tubes, &c.

Treasury Decisions.

The following decisions have been rendered by the Treasury Department under appeals from assessment of duties:

WHITE BRASS DUTIABLE AS A MANUFACTURE OF METAL.

Representations having been made to the Department that certain white metal or so-called white brass, in pigs, costing in England from £105 to £120 per ton, is classified as a metal unwrought not otherwise provided for at a duty of 20 per cent. ad valorem, decides that said substance, which is known as "Parsons No. — white metal," is not the white metal of commerce, but is composed principally of tin (60 per cent.) and zinc (38 per cent.), with traces of lead, copper and other metals, and that it should be classified as a manufacture of tin, zinc and other metal and subjected to a duty of 45 per cent. ad valorem.

DUTY ON CROCHET NEEDLES.

On an appeal from an assessment of duty at 45 per cent. on certain merchandise claimed to be dutiable at 25 per cent. ad valorem under the general provisions for needles, the Department says: "From an inspection it appears that the merchandise in question consists of what are commercially known as crochet needles, consisting of an iron wire frame with three needles of different sizes attached to the end thereof, so that they may be folded within the frame, and with an accompanying metal case capable of being adjusted as a shield for the three needles and of being used as a rigid handle for the needles. The articles are in fact and commercially known as crochet needles, and therefore the claim of the appellants is sustained."

DRAWBACK ON BUCK-THORN FENCING.

On the exportation of galvanized fencing manufactured by the Buck-Thorn Fence Company, of Trenton, N. J., wholly from imported steel and spelter, a drawback will be allowed equal in amount to the duty paid on the imported materials used in the manufacture less the legal retention of 10 per cent. The quantity of the materials so used will be ascertained as follows: Allow for each 100 pounds of the fencing known as "Buck-Thorn" 107.3 pounds of steel and 12.6 pounds of spelter, and of the fencing known as "Forms No. 1" and "No. 2," 95.1 pounds of steel and 12.6 pounds of spelter. The affidavits of the proprietor and foreman will state, in addition to the particulars required by the General Regulations, that the fencing entered for export, and specifically described therein as "Buck-Thorn," or "Form No. 1" or "Form No. 2," was manufactured in form, and from the materials described particularly in the sworn statement of said company, dated February 5, 1889.

Private cable advices report that J. B. Haggin, who controls the famous Anaconda Copper Mine, at Butte City, Mon., has left Paris for London. Mr. Haggin is credited with being the one most difficult to please in the copper negotiations at Paris, and his departure is interpreted as a sign unfavorable to a possible "deal."

Emerson & Midgley, of Beaver Falls, Pa., who have been at work for two years developing the manufacture of wire belting, have now carried it to a point where they are prepared to do work on a large scale. They have shipped the main wire belt to drive the American exhibit at the Paris Exposition.

Hardware.

With a view to obtaining direct from the trade accurate and detailed advices in regard to the condition of business and the prospects for the present season, we addressed inquiries to Hardware merchants engaged in both wholesale and retail business and situated in places large and small and in all parts of the country, asking them to report to us frankly the state of trade and its outlook. To these inquiries we have received a multitude of replies and a mass of valuable matter bearing on this question, so that we are enabled to give an especially full and reliable report concerning the Hardware trade in the different States. Our information coming from jobbing houses and retailers at many different points in each State enables us to take a more accurate and comprehensive view than could otherwise be obtained of the conditions existing in the different localities and the feeling of the trade in regard to business. The synopsis and condensation of these reports given below will be of service to manufacturers and merchants, as enabling them to judge intelligently as to existing conditions, and to frame their business policy accordingly. It is not feasible in one issue to cover the entire country in this review of the market, which will be continued next week, with a special reference to the South and West.

Our acknowledgments are especially due to our correspondents who have so courteously and intelligently supplied the data for this article.

Maine.

The partial failure of the crops last season is being seriously felt in many parts of the State, and Hardware, as well as business in general, is reported as only fair and in some places rather quiet since the 1st of January. The farmers are, however, feeling in good spirits and will increase the acreage of the crops over last year, and with the early spring and generally good prospects for the season are feeling encouraged. In nearly all parts of the State the prospects for building and repairing are excellent, and at some places an unusual number of new buildings are being projected. Most Hardwaremen are carrying only average stocks, which in some cases are smaller than usual on account of the uncertainty in regard to prices and the fact that, owing to the lack of money with the farmers, a heavy trade was not anticipated during the opening months of the year. From some interior points we are advised that the Interstate Commerce bill bears injuriously upon trade, as, having no direct water communication, they have to pay the railroads for the long haul. Collections from the farmers are reported slow but from Hardware merchants fair. A hopeful feeling pervades the reports from this State.

New Hampshire.

A satisfactory condition of general business is reported, and Hardware generally is referred to as in good shape, with a good regular demand without special features. Well-assorted stocks are carried without special curtailment on account of uncertainty in regard to prices, and the outlook is regarded as favorable. Our advices in regard to the movement of building throughout the State are not as full as we could desire, but they indicate that there is a fair activity in this respect. The early spring has a favorable effect on business, and little complaint is made about

collections, though they are evidently rather sluggish.

Vermont.

Our reports indicate that Hardware as well as business in general is somewhat dull, the condition of the roads in some parts of the State militating against an active trade. Stocks of Hardware are fair, and despite very low prices, which have a tendency to become lower, are purchased on the hand-to-mouth principle. Prospects generally for trade the next few months are good, with about the usual amount of building. Agricultural conditions are not satisfactory, there being some complaints of dry weather. Farmers as a rule are not disposed to buy beyond their absolute needs, and are slow in making payments, collections being thus unsatisfactory. One of our correspondents remarks that "good crops and better prices would improve trade very much. There's no end of things the farmer needs if he could only get money to buy with."

Massachusetts.

The reports from this State are in the main satisfactory and indicate a good business during the season thus far, with very fair prospects for the summer. General business during the winter has been in the main about equal to former years, and the Hardware trade has been up to the average, being reported in many towns as good, although from some points the complaint is made that it has not started in with the opening of spring as vigorously as was expected. In many places there is an excellent prospect for building, but in some the question as to the hours of working introduces an element of uncertainty. Many additions to factories and the establishment of new manufacturing concerns are reported, and in some representative towns the prospect for building is referred to as never having been better, and in others as better than for several years past. Stocks of Hardware are fair to large, the condition of business justifying the keeping of good stocks, while the unsteady state of the market has prevented dealers from buying largely. Little complaint is made in regard to collections, which from some points are reported as very good and in others as rather slow. Farmers do not seem to have much ready money, the winter having been for them rather unfavorable.

Rhode Island.

Most of the manufacturers are doing a fair business and making a large quantity of goods at small margins of profit. From Providence our reports indicate that February and March were quiet but that trade is now improving, and Hardware is moving in an average way but at low prices. Stocks throughout the State are not large, but well assorted, merchants being careful to avoid overstocking on account of their feeling that prices are not firm. It is gratifying to observe that from nearly all points our reports indicate a prospect for a fair amount of building and the expectation that trade for the season will be fair. Lack of promptness in collecting is to be noted.

Connecticut.

During February and March trade was generally quiet, beginning to show increased activity with the advance of the season. From some points there are indications that with warmer weather there will be an improved business, but other merchants do not take so hopeful a view of the situation. There is a general recognition of the weakness of prices, and the tendency toward the coming together of manufacturers and consumers is referred to as embarrassing dealers and gradually reducing the margins. Comparatively few towns report as much building as usual, but from some there are

indications of more than the average. Collections have been slow but are improving, as the country trade is starting, but it is necessary for merchants to push them in order to keep them up to the mark. There are a number of new industries being started in several places which are stimulating local trade.

New York.

Advices from the trade throughout the State indicate that there is about an average business in trade generally and that Hardware is similarly situated. Jobbing houses in the interior report a considerable volume of business, especially in heavy goods, in which the margins of profits are small, and also in seasonable goods, which are moving freely, while the trade on General Hardware are ordering sluggishly and are careful not to exceed their near requirements. In a number of places the indications point toward a good deal of building, and there is an apparent disposition on the part of those possessing means to put their money in real estate, and accordingly in many places the outlook for building is referred to as especially good, with the intimation that small and comparatively inexpensive houses will have a prominent place. Merchants are generally buying carefully and carrying as small stocks as possible, on account of their apprehension that lower prices may rule; and it is evident that stocks of Hardware are below rather than above the average. There is nothing discouraging in the outlook for the business of the next few months, and as the trade have been buying cautiously and are carrying light stocks it is anticipated that with fair crops a good business should be done. Nothing special in regard to collections is to be noted, there being some complaint, with the indications, however, pointing to about the ordinary conditions. From a representative wholesale house in Central New York we have an exceptionally full and satisfactory report, from which the following extracts will be of interest:

General business seems to be about the same as last year at this time, if anything a little duller, particularly the city trade. The Hardware business was better in January, poorer in February and better again in March than in 1888. Prospects for the immediate future are fair, and we see no reason to expect a much better or a much poorer trade than we had last year. Retailers' stocks are generally considered small, or at all events not above the average. In this city there is much building of small houses on loan-association funds, but no large contracts are made out. Collections are only fair. We take much paper, but our trade is generally solvent. The crop of last year was a fair one, but prices ruled so low that the farmers have little money to start this year with, and this will tend to restrict trade.

New Jersey.

This State reports a steady and satisfactory trade, with the differences as to volume and tone which are to be expected in different localities. Building is generally referred to as active, most of our correspondents referring to their localities as likely to erect more than the usual number of buildings during the present season, and one of them remarks that this appears to be about the only way in which capital can be made use of. There is accordingly an improved demand for Building Hardware, in which line there is a fair activity. Stocks are about as usual, in most cases being kept up well, but the proximity to the markets justifies many of them in carrying comparatively small quantities of goods. While the general situation is thus satisfactory, it is evident that there is not much life in trade, and the low and uncertain prices have their effect in checking purchases, so that travelers in many cases report business as comparatively quiet. The disposition of manufacturers to deal direct with consumers is referred to as one of the annoyances with which the trade have to contend.

Maryland.

Our reports from this State are not as numerous and comprehensive as we could desire, but from those in hand it is evident that Hardware, as well as general business, is not in a satisfactory condition. Stocks of Hardware are apparently only adequate to requirements, no overstocking being perceptible. Prices are low, with no visible tendency to advance. Collections are only fair. We give the following advices from a prominent Baltimore house, which will be of interest as reflecting from their standpoint the condition of the market at large:

From all that we can learn as to business in general it is characterized throughout the country by a lack of activity, and where extra efforts are made to force trade and stimulate a demand for goods which does not naturally exist the cost attending such efforts is so great that the net profits are most unsatisfactory. We do not believe that the stocks throughout the country are in excess of its needs, but with the facilities of replenishing so easily when exhausted there is not the necessity nor the disposition for the trade to buy as largely as in former years. Regarding prices we can hardly believe it possible for lower figures to be reached than now prevail, except it be with such goods as are held in combination or pools. We believe that generally the condition of the agricultural section is as good financially as ever at this season of the year, which means that if the fruit escapes the frost, the wheat the rust, the corn the worm, the cotton the drought and the stock have grass enough, the farmer may be able to pay his store bills from the growing crops. Little money can be expected from the cotton States until next fall, though we suppose general collections are about as usual. We think for such goods in our line as may be considered necessities the demand will be fair, though economy may be shown in building.

Pennsylvania.

General business since the 1st of January is from nearly all points reported as fair, there having been in some sections a falling off within the last few weeks. Hardware is moving in fair volume, but there is no snap or activity in business. In the coal region trade is referred to as quiet. Stocks are generally well assorted and in a number of towns are reported as large, but there is no general disposition on the part of the trade to speculate, and owing to the unsettled condition of the markets goods only for immediate requirements are carried. Our correspondents generally refer to the downward tendency in prices. Agricultural conditions are favorable, the outlook for the growing crops being good, while it is, however, too early to predict confidently. Prices of country products have been exceedingly low, owing to overstocked markets, and the trade feels the effect. In nearly all parts of the State the prospects for building are, however, excellent, and from Philadelphia, Pittsburgh, Reading and other points this feature is referred to, with the intimation that it is better than for several years and that many dwellings and some fine business houses are in prospect of erection. There is a good deal of diversity in regard to the view of the trade as to collections, such points as Philadelphia and Pittsburgh reporting them fully up to the average, and with but little cause for complaint, while smaller points, where there is more direct contact with country trade, report them rather slow.

Ohio.

The reports from this State are gratifying, and it is evident that compared with the condition of things in other States Ohio has little reason for complaint. The volume of general business compares well with last year, but from some points it is referred to as rather quiet, with a certain feeling of depression. Most of our advices indicate that the Hardware business is satisfactory in volume, though perhaps showing some falling off from last year's figures. The large jobbers generally refer to trade as good, but reports from the

smaller jobbers are not quite so encouraging. The tone of the reports from retailers in different parts of the State is in general well represented in the following, which comes from Springfield, though, of course, in different localities there are special conditions affecting the situation:

In a general way trade has not been for the new year as large as was looked for, nor what it should be after the general slowness during 1888. The Hardware trade in particular is an exception. There has been a general increase since the opening of the year in sales and in confidence for the future. Small stocks, as a rule, are carried, and less buying ahead has been done than for some years. Prices are being better held than for some time by both jobbers and makers of goods with the exception of some few leading articles, such as Nails, Strap and T Hinges, Wire, &c. The prospect for trade for the months to follow is good. Shops are running full force. The farmer is in hard luck, with low prices for his product and an exceedingly small demand for what he brings to market. Collections are much better as a rule than for the same time a year ago, with more ready cash paid for goods.

While reports from other points are not in all respects as gratifying as the above, there is general agreement that the outlook is encouraging, our correspondents, with scarcely an exception, referring to the prospect for trade the next few months as promising. The amount of building throughout the State will evidently be up to the average, but the low prices ruling for farm produce will diminish building through the farming sections, but it is probable that the anticipated activity in towns and cities will more than make up for this. While there is some complaint in regard to collections as a little slow, and in some cases as decidedly so, it would appear that as a rule they are fully up to other years.

Kentucky.

Our advices from this State indicate that an excellent condition of things prevails, and there are some evidences of improvement over last year. General business is fair and the early spring has a stimulating effect upon it. Hardware is up to the average and there is at present a good demand for goods generally, but Iron is rather dull. The stocks in the hands of retailers are fair, but not heavy. There has been no buying of a speculative character for a long time and consequently stocks are light, but well assorted. Notwithstanding the good volume of business prices are low and this fact has the effect of deterring the trade from purchasing beyond their requirements. The prospect is regarded as good for a steady trade, with good prospects for building, as many dwellings, especially small dwellings and other buildings, are under contract. Collections are in rather better shape than usual. The crop prospects are regarded as excellent. With reference to general conditions a correspondent writes:

Competition for trade is closer than ever and profits much reduced. The year past has been one to make both manufacturers and jobbers scan expenses more closely, with a view to reducing the same.

Michigan.

During the early months of the year business was quiet and rather depressed, and with this condition Hardware naturally sympathized, but with the approach of spring there has been a marked improvement and our advices generally report a satisfactory business, to which, however, there are some exceptions, as other merchants refer not only to the trade of the past six months as having been the poorest in years, but also allude to the opening of spring as bringing only a slight improvement. Such reports, however, do not represent the general tone throughout the State, as many merchants are doing a good business, with stocks that are fairly well assorted and in some cases large, as the low prices induced free purchases. Farmers generally are without much

money, and the decline in wheat has a depressing effect. A good crop, which is indicated at the present time, will do much to induce a very satisfactory business. Stocks are fully up to the average and well assorted, and in some cases large, as travelers have been persistent and prices cut. A general tendency, however, to buy often and in small quantities is noted. The general downward tendency in prices is recognized. In some parts of the State the prospects for building are good, but in others there is little enterprise in this direction, and reports generally indicate that there will not be as much building as last year. The present indications point to a good season for agricultural products, as wheat came through the winter in excellent condition and looks promising, while the mild weather and early spring have an encouraging effect on the farming community. Few merchants report collections as good, most of them referring to them as slower than usual or only moderate. From a well-known house in Detroit, doing principally a retail business, we have the following:

Our trade is better this spring so far than it was last year or the year before, and we do not know of any reason why it should not continue. We are aware that the Hardware trade generally complain of dull trade. Stocks of Hardware, we believe, are generally small. We have bought largely this spring ourselves, as we consider the general lines good stock at prices which we think are down at bottom. Building prospects here are good and we consider the agricultural condition all right. Collections are about as good as usual, and we do not see why business for 1889 should not be better than any of the last three or four years.

Indiana.

General business is fairly active, but to a certain extent the partial failure of the wheat crop last year has affected it. The excellent prospect, however, for crops the present season induces a hopeful feeling, and there is little ground for complaint in regard to the volume of business. Most of our reports reflect a good condition in the Hardware trade, but it would appear that business is somewhat better in the Northern than the Southern part of the State. Several of our correspondents allude to their sales this spring as comparing well with those of last year. Full stocks are generally carried and well assorted, but the trade are buying carefully and in such quantities only as are required for their business, without much disposition to buy beyond their near requirements. Prospects for building are good, and it is probable that the amount of building will be somewhat above the average. Collections are only fair, but show some improvement during the last 30 days. Other points in regard to the condition of business are mentioned in the following careful review, which applies more or less accurately to conditions in the State generally:

Since January 1 business has been quiet, owing to the almost entire failure of the wheat crop last year and the low price of corn and cattle, and Hardware, in sympathy with other lines, is dull. The depression, however, does not seem to have affected the solvency of dealers to any extent. The stringency has had the effect with most dealers to reduce stocks, and as a consequence stocks are light though well assorted. The prospects for a fair summer and fall trade are good, and there are more buildings in progress and in contemplation than usual. The early spring weather has been favorable for the growing wheat, which now promises an abundant crop. The preparation of ground for corn-planting is well advanced and a large acreage will be put in. Tax-paying time is keeping back collections, which through the season have been fair. The general impression is that there is a strong conservative feeling existing among the Hardware trade of this vicinity, and they are carrying out this sentiment by buying often and in smaller quantities than usual.

Another correspondent writes:

Salesmen traveling in the Northern part of our State are generally having fair trade,

while in the Southern part they report trade quiet. Farmers are holding meetings to oppose the high price of Binder Twine, and frequently implicate local dealers as being instrumental in maintaining these prices.

Illinois.

The low price of produce and cattle has a certain depressing effect on the markets, and business in general does not vary much from last year's volume, and is reported by many merchants as being somewhat better, and some of them refer to the demand for Hardware as having been exceptionally good. There are, however, others who find it rather quiet, but this is not the general tone. Our correspondents, with scarcely an exception, refer to the prospect for the summer and fall as being very gratifying, and their anticipations are based on the general activity in business, the prospect of at least the average amount of building (the outlook for which is especially good in the large cities) and the expectation that the crops will, as at present indicated, be good, if not large. These conditions, together with the fact that retailers generally are carrying only moderate stocks, and are usually in good shape financially, though experiencing some difficulty in making prompt collections from their customers, induce a hopeful, if not confident, feeling. Chicago reports a very satisfactory business, and trade during the season has been active. As reflecting conditions in central Illinois we give the following synopsis of advices from a well-known jobbing house in the interior:

We have sold 30 per cent. more, according to the footings of our sales up to January 1, than during the same time last year. Stocks of Hardware are better than they were the first half of 1888, but the dealers generally have gotten so much into the habit of depending on the jobbers for supplies that there are no large stocks carried. Staples are sold on as close margins as we have ever known, but the profit on other goods is better than usual. The prospects for trade during the next few months are the best we have had in several years, and the outlook for building is excellent. We have a few chronic slow customers, but the balance of them seem to have money enough to meet their obligations.

Wisconsin.

Business in general in this State has been disappointing and lighter than usual. The condition of the Hardware business is not satisfactory, but in some sections of the State the prospects for the next few months are referred to as fair, while still others anticipate a trade exceeding that of last year or the year previous. Building prospects are only fair, though they are reported good from two or three points. Stocks are light and in some cases well assorted. Prices rule very low, owing to excessive competition, and are regarded by some of our correspondents as at bottom, which leads them to a hope that an advance may develop. The condition of the crops is generally referred to as unsatisfactory, leaving farmers with but little money, which injuriously affects trade and makes collections slow. Traveling salesmen report general sluggishness. We append a few extracts from the report of a well-known wholesale house:

The volume of business in this vicinity for the past eight months has been lighter than for 25 years during the same months. Hardware business has been even lighter than general business. Stocks in the hands of retail dealers are unusually light. Most staple articles are lower than ever known before. This is especially true of Iron and Nails and Barb Wire. Prospects of building are not flattering. No building of any consequence of the better class, houses erected being mostly of the cheaper kind. All through this neighborhood the hay and grain crop of 1887 was a failure and the grain crop for 1888 was light, very seriously affecting business and making collections very slow. Traveling salesmen say that business is light and must continue so until after a good general crop.

Iowa.

The tenor of reports from this State is satisfactory, indicating a fair to good business, with an excellent outlook. The

crops last year were good and promise well this year, the spring having been unusually favorable for agriculture and the prospect for large crops excellent. Indeed, one of our correspondents calls attention to the over-abundance of the crops in these terms:

In fact, we raise too much on an acre of ground in this State—too much corn, too much oats, too much potatoes, too much beef. All the above articles are sold too cheap. It takes about 7 pounds of beef to purchase 1 pound of Binder Twine.

The low prices thus ruling naturally affect business, but the volume of trade is evidently up to the average, as indicated by the following reports on this point, which are selected at random from those we have received:

The Hardware business is very good. A large demand for goods in this [Burlington] region. Very good during February and March, but light the first two weeks of April; but we now look for very nice business, recent rains having revived farmers' prospects. For three months ending April 1 not as satisfactory as desired, owing to very low prices ruling for farmers' produce of all kinds and the absence of rain. Since April 1 trade much improved; quiet, but looking up; healthy generally.

Stocks are kept up sufficiently to meet the wants of the trade, with no disposition to carry large stocks for speculation. They are generally reported well assorted but rather light. One of our correspondents alludes to the stocks of Hardware as not large but numerous, "that is, there are a great many stocks," with a very animated competition, which reduces profits to a minimum. It is not intimated that there will be more than an average number of new buildings erected, but with the existing agricultural conditions and hopeful feeling that prevails as to the business of the season, and if crops should turn out well, it is thought that a large business will result. Reports in regard to collections vary very much according to the locality and the idiosyncrasies of individuals, their general tenor being that they have improved since February and are fairly good, with a tendency still toward slowness. Travelers generally do not give as encouraging reports as merchants, a matter which is thus referred to by one of our correspondents whose judgment is entitled to weight: "Travelers generally report light sales. If, however, the sales of each one to the many dealers and the business of the many salesmen with the many dealers were aggregated, it would appear surprisingly different." The point is also made as promising well for the future of the State that immigrants are now more numerous than emigrants, while for some years past this has hardly been the case. This synopsis may appropriately be supplemented by the following report from a prominent jobbing house:

The condition of business generally at the present time is fair; some lines are doing better than others, though we hear of no complaints of dull trade from any source. The Hardware business is very brisk and has been for the past six weeks. The movement of heavy goods, such as Nails, Barb Wire, &c., has been lighter than at corresponding season of 1888, but sales of Shelf Hardware are larger. The stocks of Hardware in the country are not as heavy as usual at this season. Prices average lower than they have for years, and must be near bottom. The prospects for trade during the next few months are encouraging. The early spring and recent rains have created a feeling of hopefulness and confidence throughout this section. We do not look for unusual activity in building operations. Collections are quite satisfactory—better, in fact, than was anticipated at the commencement of the season. Our salesmen are keeping up their records of sales as in former years, and anticipate that the present year will be a very prosperous one.

Barb Wire.

The Eastern market supplied by this city is characterized by a gratifying activity, and a good deal of business is being done. To such an extent is this the case

that some of the manufacturers have difficulty in making as prompt shipments as they desire. Prices are without change, on the basis of 3.5 cents for carload lots, 3.6 cents for 3-ton lots, and 3.8 cents for smaller parcels, with deliveries as usual.

An article has appeared in some of the Western papers intimating that some of the Barb Wire manufacturers of St. Louis were intending to close down their works owing to the condition of the market and the disadvantages in freight discriminations under which they are laboring. It has also been stated that a circular has been issued by the Freeman Wire Company suggesting this. But we are authorized to deny this report so far as the Freeman Wire Company are concerned, and are advised that the company have not directly or indirectly issued a circular suggesting this cessation of operations, and that it is not their purpose to close their works, the only foundation for such a report being their intention of remodeling and readjusting their Wire mill, which, as a matter of fact, would require only a slight suspension of business, possibly for from three to five weeks.

Cut Nails.

Quite a considerable volume of business is being done, with quotations remaining at \$1.80 to \$1.85 for carload lots on dock. It is reported that all but three signatures have been secured to the pool plan excepting one leading mill in Central Pennsylvania, which declined to enter from the start.

Miscellaneous Prices.

The Standard Fiber Ware Company, Mankato, Minn., and 105 Lake street, Chicago, Ill., quote their Flax Fiber-Ware at the following prices, which relate, it will be observed, to both decorated and plain:

Flax Fiber-Ware.

	—Per dozen.—	
	Plain.	Decorated.
Water Pails, 12-quart.....	\$4.00	\$4.50
Dairy Pails, 14-quart.....	4.50	5.00
Fire Pails, No. 1, 12-quart, No. 2, 14-quart.....	5.00	5.50
Sugar Pails (with cover).....	6.00	6.50
Chamber Pails, No. 1, 12-quart; No. 5, 14-quart.....	6.50	7.50
Slop Pails, No. 1, 12-quart; No. 5, 14-quart.....	6.50	7.50
Commode Pails, No. 1, 12-quart, No. 5, 14-quart.....	6.50	7.50
Slop Jars (balance trap).....	8.00	9.00
Commode Rings.....	1.50	1.50
Wash-Basins, 10½-inch.....	2.00	2.25
Wash-Basins, 12-inch.....	2.25	2.75
Wash-Basins, 13½-inch.....	2.75	3.25
Wash-Basins, 15-inch.....	3.25	3.75
Fruit Bowls.....	2.50	2.50
Servers, 12-inch.....	2.00	2.00
Keelers, 11¾-inch.....	4.00	4.00
Waste Paper Baskets, 13 inches high.....	6.00	6.00
Mats, 9 inches (for table use).....	1.00	1.25
Mats, 15 inches (for Cuspidors, &c.).....	3.00	3.50
Mats, 17 inches (for Slop Jars, Spittoons, &c.).....	3.50	4.00
Mats, 20 inches (for Slop Jars, Spittoons, &c.).....	4.00	4.50
Cuspidors.....	8.00	8.00
Cuspidors and 15-inch Mat, combined.....	11.00	11.00
Spittoons, Daisy, 8-inch.....	4.00	4.50
Spittoons, 10 and 11 inch.....	6.00	6.50
Peck Measure.....	4.00	4.00
Half-Peck Measure.....	3.50	3.50

The following revised prices of Lead Pipe, Sheet Lead, Block Tin Pipe, &c., are announced under date April 22:

	Per pound.
Lead Pipe.....	5½¢
Sheet Lead.....	6½¢
Tin Lined Lead Pipe.....	15¢
Block Tin Pipe.....	45¢

It has been known for some time that the prices of Hot-Pressed Nuts have been more or less irregular, and concessions have been made beyond the prices agreed upon by the manufacturers. This has led to the giving up of the association on these goods, and the makers are now free to sell at such prices as they desire, untrammelled by combination. It is, however, to be noted that the prices ruling are about those at which the goods have been selling,

and that the present condition of things has not resulted in inducing materially lower quotations. It is to be borne in mind that Cold-Pressed Nuts, on the other hand, are in excellent condition, the agreement between the manufacturers being well maintained. A reduction of $\frac{1}{10}$ cent per pound has been made, in sympathy with the reduced cost of the raw material, but the new prices are referred to as firmly held.

Walbridge & Co., Buffalo, N. Y., issue an interesting catalogue of their iron Reservoir Vases, which, besides giving illustrations of this well-known line, represent also Lawn Chairs, Settees and some staple Hardware. The line of Vases is exceptionally complete, including small and inexpensive ones, as well as those of more artistic pattern and more imposing dimensions. Illustrations, with a full statement of measurements, are given of the different patterns, together with list prices. One of these patterns is, it will be observed, shown in their advertisement on page 55, in which some further particulars are given in regard to the goods. The description given in the catalogue of the construction of these Vases, and the manner in which they are supplied with water, is clear and interesting. The new styles of Vases shown are especially worthy the attention of the trade. The discount sheet relating to these goods is as follows:

	Discount.
Vases.....	30%
Settees.....	30%
Globe Lawn Sprinklers.....	40%
Lawn Sprinklers Nos. 10 and 50.....	50%
Prize Hose Reels.....	60%
Philadelphia Mowers.....	60%
Stable Fixtures.....	40%

Van Wagoner & Williams Company, 82 Beekman street, New York, have issued a new catalogue showing their well-known line with recent additions. The new goods are especially in the line of Wire Coat, Hat and other Hooks. It is to be noted that the convenience of the trade is consulted in making the Real Bronze Spring Hinges subject to discount, the same as the other styles, instead of having them net, as heretofore. We shall have occasion again to refer to some of the new goods. The following is the discount sheet of the company:

	Discount.
Basin Wrenches.....	40%
Bed Keys.....	15%
Blind Adjusters, Domestic.....	33 $\frac{1}{2}$ %
Unique.....	33 $\frac{1}{2}$ %
Bolts, Doen's.....	70&10%
Door Pulls, Gem.....	50%
Door Springs, Gem.....	10%
Star.....	20%
Torrey.....	33 $\frac{1}{2}$ %
Hooks and Eyes, Malleable.....	70&10%
Hooks—Ceiling, Acme.....	50%
Champion.....	50%
Gem.....	50%
Miles.....	50%
Hooks—Coat and Hat, Crown.....	50&5%
Gem.....	50%
Hero.....	50%
Miles.....	50%
Monarch.....	50%
Royal.....	50%
Union.....	50%
Hooks—Wardrobe, Climax.....	50%
Domestic.....	50%
Empire.....	50%
Jewel.....	50%
Victor.....	50%
Latches, Crown.....	40%
Cupboard.....	45%
Rail Screws.....	70&10%
Sash Lifts, Gem.....	50%
Climax.....	50%
Spring Hinges, Acme.....	30%
American.....	20%
Cabinet.....	10%
Crown.....	25%
Empire.....	25%
Gem.....	20%
Hero.....	55%
Imperial.....	20%
Monarch.....	55%
Oxford.....	20%
Show-Case.....	35%
Star.....	20%
U. S.....	25&10%

Obituary.

William L. Humason, president of the Humason & Beckley Mfg. Company, New Britain, Conn., who are well known as Hardware manufacturers, died at his home in New Britain on the 15th inst. Mr. Humason was born in Simsbury in 1821 and went to New Britain in 1851, where he engaged in business, and in 1864 established, with others, the company with which he has since been identified. At a meeting of the directors of this company, held on the 19th inst., the following resolution was adopted:

Whereas, It has pleased Almighty God in His providence to remove from our midst our friend and counselor, William L. Humason, the founder and president of this company; be it

Resolved, That we sincerely mourn our loss; that we honor his memory; that we honor him for his many noble qualities; that we acknowledge it was through his wisdom, skill and guidance, his unswerving integrity and ability, that this company has been brought from a small beginning to its present standing among the manufacturing interests of the country.

The death of Nelson Sawyer, senior member of the firm of Sawyer Brothers, of Columbus, Wis., is announced. For upward of a year and a half Mr. Sawyer had been in failing health, but not until about ten weeks before his death was he obliged to remain at home. He was born in Wendell, Mass., in 1833. In 1853 he went to Wisconsin and entered the employ of Spencer & Buxton, then the leading blacksmithing firm and jobbers in Columbus. Upon the death, not long after, of Mr. Spencer he became a partner. On the 1st of April, 1867, he associated himself with his brother Lewis J., then the proprietor of a Hardware establishment in Columbus, and a successful business was carried on for the following 22 years. He is referred to as a man possessed of noble qualities, generous impulses, energy and excellent business qualifications.

Hardware in the Centennial Celebration.

In the absence from the city of the president of the Hardware Board of Trade, Edward H. Cole, secretary, will represent the organization at the centennial parade May 1. The body of men already accepted for the industrial parade numbers some 110,000, and the procession will require 17 hours, it is estimated, to pass a given point, unless arrangements which are under advisement are carried out to diminish the number, or consolidate the parade in such a way as to facilitate its progress. It is thus obvious that the necessity of the case calls for a reduction rather than an increase in the number of those participating in it, and under these circumstances it is manifestly impossible that the boards of trade of the city, of which there are more than 100, should take part except through individual representatives. General Butterfield has accordingly invited the boards of trade and other organizations of like character to be represented and participate in the parade in simply a formal manner, and under this invitation Mr. Cole has, as above stated, been appointed to represent the Hardware interests. General Butterfield will name the delegated representative as an aide, and the aides so named will be assembled at a given point up-town on the morning of the parade, where they will be provided with a sash as the badge of office. When the procession arrives at that point it will be halted and the representatives or delegates will precede the column in passing the President, and after marching past the President will take seats reserved especially for them on the grand stand south of the President. A committee will prepare a brief address to be engrossed upon parchment and inclosed in a silver case. This address will be signed by all representatives of the societies

of a civil, industrial and business character and be presented to the President. The united delegates will also provide a gold medal, a silver medal, and banners to be offered as prizes or awards to the civil or industrial organizations in the parade which shall be decided by competent judges to have best complied with the rules made necessary to make the parade a success, together with making the most agreeable and effective display. The gold medal will be awarded to the first, the silver medal to the second, and the banners to the third, fourth, fifth and sixth. The decision in this award will be made by 50 or 100 men who will be stationed at different points along the line of march.

Items.

Horton, Gilmore, McWilliams & Co., of Chicago, recently effected a sale of Hardware under rather peculiar conditions. The bill of goods is quite large, covering a very general assortment, its destination is California, and it will be shipped from New York via Cape Horn. It is believed to be the first case on record of a shipment of goods from a Chicago Hardware house to California "around the Horn."

W. H. Keeler, Buffalo, N. Y., has issued a catalogue explaining his patent Printing Wheels, which are on the market to take the place of Stencils. They are referred to as printing perfectly and rapidly with a neat and business-like effect, and are designed especially for putting the name and business of the merchant prominently before the public on boxes, wrapping paper, packages, bags, &c. A large number of sample impressions are given, showing the kind of work done by the Printing Wheel and indicating the variety of its adaptations.

Fayette R. Plumb, Philadelphia, Pa., has issued Supplement No. 1 to his catalogue of 1888. It is printed in the same elegant style as his catalogue and represents a line of Picks, Mattocks, Grub Hoes, Pick-Eyes and Striking Hammers. In his introduction he refers to the necessity of engaging in the manufacture of this line of goods in order to complete his line, and states that he succeeded a few months since in closing negotiations with the proprietors of the Washoe Tool Company, thereby becoming sole owner of their entire plant. New shops have been erected with improved equipment, thus giving him an exceptionally large capacity for the production of these goods. It is intended to make these Tools of the best material, and in addition to the regular line some of the leading goods are made from solid cast steel. It is stated that these goods will be manufactured from a soft steel for welding properties equal to the best refined iron, and that the points will be made from best tool steel and contain double the amount of stock ordinarily used for this purpose. They will be ground perfectly clean, finished in oil, and care will be taken in each department to see that they are perfect. The two leading patterns of Drilling or Striking Hammers, made from a high grade of tool steel, are also presented.

The Paddock-Hawley Iron Company, St. Louis, Mo., have issued a new catalogue and price list. It is a compactly arranged volume of 660 pages, which are well utilized in illustrating the variety of goods they are handling as manufacturers, agents, importers and merchants. After a full and satisfactory index the volume opens with Iron, Steel, Plow Shapes, Corrugated Iron, Spikes, Bolts, Nails, Horse-shoes, Anvils, Vises, Forges, Drills, Tire Benders, &c., and a large variety of tools and supplies for blacksmiths and machinists. Wagon Hardware occupies an important part of the catalogue and is represented in large variety; Lamps, Gears,

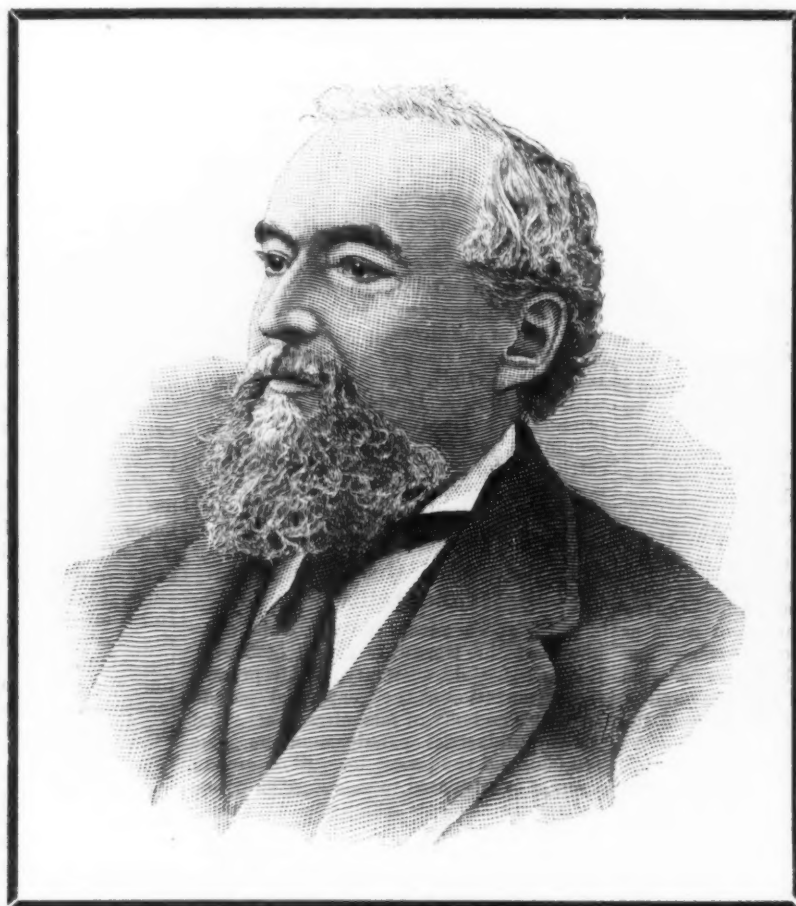
Bodies, Wagon Woodwork, &c., are appropriately shown. List prices are given throughout, the lists being the standard ones for the most part. The volume closes with interesting tables of estimated weights, and other useful information in regard to Wire Gauges, weight of metals, number of Spikes required, tempering steel, &c. It is a very creditable volume, which will be appreciated by the trade.

The Pike Mfg. Company, Pike Station, N. H., have issued a very convenient catalogue and price list for the present year, and call attention to the fact that they have added to their line since issuing their last number. The catalogue is fully illustrated, cuts being given of the different brands and qualities of Scythe, Axe and other Stones. A new and interesting feature,

Edward B. Mead.

The death of Edward B. Mead on the 1st inst., at his home in Brooklyn, N. Y., removed one who had occupied a prominent place among Hardware merchants and who was widely known and held in high esteem. His connection with the Hardware business extended nearly as far back as that of any of the Hardwaremen of the present day, and a retrospect of his business career recalls times which are beyond the recollection of the great majority of those who are now actively connected with business life, and conditions which are very different from those now existing. At the time of his first connection with the Hardware business probably not more than 7½ per cent. of the goods sold in the United States were of

position in the store of the well-known house of William N. Seymour & Co., Chatham square, and through his influence a position was secured for him with Henry A. Beach, a broker, in whose employ he continued for some three years. In 1840 he obtained a position as clerk in the Hardware commission house of Woods & Wheelwright, 11 Platt street, his first connection with the trade in which his life was spent. On their giving up business he returned to his home in Delaware County, where, however, he remained only a short time, returning to New York in 1843, where a position had also been secured for him by his brother Andrew in the house of George Briggs & Co., commission Hardware merchants, 115 Maiden lane, with whom he continued after their removal in 1846 to No. 9 Platt



EDWARD B. MEAD.

Born 1821; died 1889.

the convenience of which will be appreciated by the trade, is the fact that under Arkansas, Washita and other Oil Stones different assortments are given. The cuts of unusual Stones, such as Knife Blade, Triangular File Piece, Needle Piece and others, as well as the more regular goods, are of interest.

The Sullivan Hardware Company, Anderson, S. C., is referred to as one of the leading concerns in Anderson, in an article published in the *Greenville Daily News* of recent date, in which the business position and enterprise of the city are extolled.

Packard & Co., Greenville, Pa., issue a special Gun catalogue, in which a variety of Breech-Loading Double Guns are shown, together with Muzzle-Loaders, Flobert and other Rifles, and attention is called to Gun Implements, Reloading Tools, Ammunition, &c.

American manufacture, the great bulk of them being imported from England and Germany, while at the present time the amount of imported goods sold is insignificant compared with those of domestic manufacture. It is also interesting to note that the houses with which Mr. Mead formed his earliest connections were identified with the interests of American manufacturers, and that the large concern of which he was for many years a partner exercised an important influence in the development of domestic production of Hardware.

Edward B. Mead was born in 1821 in Walton, Delaware Co., New York, and when in his sixteenth year he left home, coming down the Delaware River on a raft to Trenton, N. J. He remained in Trenton, however, but a short time when he was led to come to this city through the influence of his brother, Andrew J. Mead, who was already here occupying a

street. It is interesting to observe that George Briggs was one of the first manufacturers in this country of Steel Squares, and the veritable sign bearing his name was for many years carefully preserved by Charles Bliven, who at the time of young Mead's connection with the house was the partner of Mr. Briggs. These two persons who in later years were to be long and prominently associated together as manufacturers and merchants thus met for the first time. After a short time Mr. Mead obtained an interest in the business, the style of the firm still continuing George Briggs & Co., and in 1848, on the retirement of Mr. Briggs, who went into politics, the firm became Bliven & Mead, with Mr. Briggs as a special partner. Mr. Mead was married in 1850 and his widow survives him, as does also his brother, Andrew J., and three sisters. In 1857 the business was moved from 115 Maiden lane to 243 and 245 Pearl street.

and 18 and 20 Cliff street, the junior partners, Bliven & Mead, having purchased the interest of Mr. Briggs. The business of the firm was carried on in this location until 1877, during which time it was largely extended, the house becoming one of the most prominent in the country. The first year of the war was a trying one for the Hardware trade, and many old houses came to grief by reason of the depression in business, and in some cases by the loss of balances due them from customers in the South. The firm of Bliven & Mead, however, weathered the storm and were enabled to take advantage of the activity and business prosperity that soon ensued.

In 1854 Bliven & Mead were the New York agents for the Hart Mfg. Company, of which J. T. Hart, who had been manufacturing Hardware since 1838, was president, and in 1866 sold their business to the Hart Mfg. Company, Mr. Bliven becoming president. The business was conducted under this name until 1873, when the style was changed to the Hart, Bliven & Mead Mfg. Company, and in 1878 the business was removed from the old location in Pearl and Cliff streets to 107 Chambers street and 91 Reade street, thus following the course of the movement of the Hardware trade in this city. The company continued prosperous until overtaken by the hard times and depression of trade which were so trying to business houses, and its sales in some years exceeded \$1,500,000, ranking it among the largest Hardware houses in the country. When in the year 1878 the company were overtaken by financial difficulties and were forced to make an assignment Mr. Mead was unanimously chosen assignee to settle up the business, a task of some delicacy and difficulty owing to its manifold complications, which, however, was performed with painstaking fidelity and marked ability and to the general satisfaction of all concerned. When this was accomplished Mr. Mead was free to accept another engagement, and went to Chicago in the employ of Hibbard, Spencer & Bartlett, taking charge of their credits. The climate, however, did not agree with Mr. Mead or Mrs. Mead, and, notwithstanding the consideration in which he was held, Mr. Mead, from the strength of his associations in this city, was unable to feel contented in his new home, and after a comparatively short time returned to New York and became connected with the American Screw Company as their representative in this city, a position which he held until failing health compelled him to relinquish all business cares. During the greater part of his life he enjoyed robust health, but for more than a year previous to his death he was confined to his house by illness, so that when the end came it was not unexpected. At different periods in his life Mr. Mead occupied other positions of trust and responsibility, and among them may be mentioned his connection with the Branford Lock Works, for whom as early as 1865 Bliven & Mead were agents, and of whose board of directors Mr. Mead for the greater part of the time since that date was a member.

As a business man Mr. Mead is referred to by those who knew him best as having been thorough and indefatigable, with an exceptional capacity for accomplishing work, and as especially diligent and painstaking where the interests of other persons were involved. The greater part of his life was closely applied to business activities, and he rarely took a vacation except an annual visit to his home in Walton, where he indulged his favorite recreation of trout-fishing and tasted the pleasures of angling, to which he was an enthusiastic devotee. During his protracted sickness, which lasted nearly a year, the thought of this recreation of his boyhood and mature life was refreshing to

him, and he fancied that if he could again visit the streams which he knew so well it would be the means of restoring him to health. The cordial and genial bearing of Mr. Mead are well known by all who have been brought in contact with him, and notwithstanding the cares and perplexities of his life his geniality and cheerfulness never failed him, and there was about him even in his advanced years much of the vivacity, kindness and buoyancy of youth. These and other personal qualities and the unquestioned integrity of his character gave him many friends in the trade, by whom he was held in high esteem and who received the tidings of his death with a sincere personal sorrow.

Items.

Yawman & Erbe, Rochester, N. Y., have issued a circular relating to their Elevator Floor Stop and Lock, of which illustrations are given showing its special features and advantages, with a detailed description of the Lock.

The trade will be interested to learn that at the Melbourne exhibition, in the department devoted to Cutlery, Hardware and Iron-mongery, John Chatillon & Sons, 89 Cliff street, New York, were awarded the first order of merit on Spring Balances. We are also advised that the goods that thus received the highest commendation were the regular goods of the manufacturers as exhibited by their agent and were not specially prepared for the exhibition.

Stafford & Rix, Keokuk, Iowa, the well-known wholesale Hardware and Iron House, have sold their entire stock of Shelf and Heavy Hardware, Iron and Wagon Stock to A. Weber & Co., of that city, to whom they refer as their neighbors in the Hardware business and commend them as courteous, efficient business men, every way reliable. They further call attention to the fact that the trade will thus be offered a stock of goods second to none in the Mississippi Valley. They also in taking this leave of the Hardware trade of Iowa, Missouri and Illinois extend thanks to their customers for the long-continued patronage bestowed upon them, and invite a continuance of it to their successors. We understand that in thus disposing of their Hardware business they intend to engage in the banking business in Chattanooga, Tenn., and in this new departure will have the best wishes of their many friends in the trade, who will regret their withdrawal from the Hardware field.

Tucker & Cox, 230 Market street, Philadelphia, Pa., issue a four-page price list of Steel Stamps and Dies, in which specimens of their letters are given, with prices of their Steel Letters and Figures in sets. Their Burning Brands for the use of builders and others are also represented.

H. L. Waterman, Mills Building, New York, has been appointed agent for the Hartman Steel Company, Carnegie, Phipps & Co., Beaver Falls, Pa., for Wire Nails, Copper Wire, &c.

In our issue of February 14 a description was given of the B. M. T. Saw, devised by Warren Bundy, Minnesota City, Minn., and manufactured by the Montague-Woodrough Saw Company, Chicago, Ill., with special reference to the form of the teeth. We are advised, however, that the principle on which the teeth are constructed and arranged is not entirely new, as per the following letter from prominent Saw manufacturers:

Upon referring to some of our old papers we find that Saws made with similar teeth were made by us 30 to 35 years ago, and ever since then on the same principle. We are led to write from the fact of this being presented as something new, whereas such is not the case, for in making further search we find patents of recent date, 1877 and 1881, in which teeth were made as represented in your paper. If you

could take the time to look over the Saw catalogues you would find the principle of arranging two beveled teeth and one chiseled tooth in groups to be nothing new, having been used by different Saw-makers in this country for several years. We do not wish to be considered in the light of finding fault with our competitors for introducing what they suppose to be new devices for Hand-Saw teeth, but, being Hand-Saw manufacturers, our objection is to its being brought forward as a recent improvement.

The White Mountain Freezer Company, Nashua, N. H., issue a striking and attractive show-card designed to call attention to their line of Freezers. It is entitled "Jack Frost and His Bride," and the Triple-Motion White Mountain Ice-Cream Freezer is prominently introduced. They have also prepared a pretty lithographed card, which is furnished to the trade in any quantity desired, with their imprint on the back. Their catalogue is neatly printed, and illustrates the large variety of Freezers they make. Their New York office is 99 Chambers street, W. H. Quinn & Co. being their agents.

The Ross & Fuller Association, 33 Chambers street, New York, have been appointed exclusive agents for the sale of the Perfection Inside-Edge Stove-Pipe Elbow, manufactured by the Detroit Elbow Company, Detroit, Mich., on which they are now prepared to quote prices.

A paragraph has been going the round of the papers to the effect that a new enterprise with a capital of something like \$1,000,000 is being established at Cleveland, Ohio, for the manufacture of Screws. Inquiry develops the fact that the rumor is, however, entirely without foundation.

On page 81 our readers will observe the advertisement of C. H. Taisey, Denver, Col., in which Blood's Patent Adjustable Hose-Holder is illustrated. The points made in regard to this Holder are its durability and portability, and the fact that it will accommodate any size of Hose and in any desired position for watering purposes. The Holders are 30 inches high and are made of iron japanned, galvanized or nickel-plated, and also of polished brass. It will be understood that the legs screw into the Holder, thus permitting it to be taken apart readily, and at the end of the season laid away in small space.

Johnson & Colton, Montpelier, Vt., in their price list No. 6 describe the line of Saddlery Hardware of which they are manufacturers. They call special attention to the Colton Patent Buckle, which is made to prevent the mane or tail of a horse from catching on the point of the tongue, as it often does where a common Buckle is used. The metallic Check-Rein Loop is also specially referred to as cheaper and more durable than any made from leather.

Biddle Hardware Company, Philadelphia, Pa., have issued a circular of seasonable goods, representing Lawn Mowers, Hoes, Steel Goods, Scythes, Cultivators, Saddlery Hardware, Spring Hinges, Freezers, &c. It calls attention also to the manufacturers for whom they are agents or representatives.

John Moore, 53, 57 and 59 Warren street, New York, issues a neat pamphlet, with price list of leading styles of harness, calling attention also to horse blankets, horse clothing, &c.

C. W. Packer, 20 N. Fourth street, Philadelphia, has issued a neat and convenient price list of his Standard, Expert and Model Ice-Cream Freezers. His Confectioner's Machine Freezer is also illustrated. A brief description is given of the special features of this machine and the points made in regard to them, with some standard recipes and directions for freezing.

Handle for Milk-Can Covers.

Berger Bros., of No. 237 Arch street, Philadelphia, Pa., have placed upon the market a convenient handle for milk-can covers, a general view of which is presented herewith. The device consists of two galvanized castings, riveted together in such a way that the top or cap of the handle will revolve, while the lower portion, which is fastened to the can cover, is stationary. This permits the milk can to be rolled along upon the rim of the bottom while the operator firmly grasps the top of the patent cover handle. This is a matter of great convenience and is claimed



Seal's Handle for Milk-Can Covers.

to facilitate the loading and unloading of milk cans. The device is made under Seal's patent, and is said to be the only revolving handle made.

The New Barb Wire.

The accompanying illustration represents a two-point barb wire called the Texas barb, which is put on the market by the Iowa Barb Wire Company, 98 Reade street, New York. The special feature of this wire is that the barb is flattened one-half, with the result of saving one-third the weight of the barb, or about 10 per cent. of the total weight of the barb wire. The company advise us that tests made show that their wire has a special strength, and it is obvious that the strength is not affected by the size of wire used for the barbs, so that there is a clear saving in



Texas Barb Wire.

weight resulting from the use of Texas barb. The price for this wire will be 10 cents per 100 pounds extra, which they refer to as representing about one-third of the gain to the consumer in weight as compared with other barbs.

Safety Can for Gasoline.

In the accompanying engravings we show an automatic safety can which is being supplied to the trade by George M. Clark & Co., of Chicago, Ill., and is known under the name of Jewel. This can is provided with a malleable-iron head or nozzle which cannot be dented or pressed out of shape, rendering it very durable. It is constructed with a double pitcher-shaped outlet, which permits of its use by either right or left handed persons. Referring to Fig. 1 of the engravings, A is a valve or stopper which is held firmly to its seat by a strong spring, a general view of which is shown in Fig. 2. The construction of this valve is such as to practically make a close ball-joint, being easily opened for use and which instantly closes when released from the hand. The stopper being below the upper part of the nozzle, is

fully protected from disturbance should the can by accident fall to the floor or come in contact with any object. A guard



Safety Can for Gasoline.—Fig. 1.—General View of Can.

placed within the can prevents the stopper being drawn up too far and straining the spring. This spring is made of steel



Fig. 2.—View of Valve and Spring.

wire, spiral in form and satisfactory in operation. The valve is made of hard brass, and is automatic and self-adjusting in its action. This can is protected with a wooden bottom provided with slots cut

New Freezers.

The Gooch Freezer Company, Cincinnati, Ohio, are placing on the market this season the Zero, the Pet and the Boss Ice-Cream Freezers, which are referred to as



Fig. 1.

well finished and made of the same material as their well-known Peerless, which has been on the market for the past 18 years. The Zero, Fig. 1, is a full-sized freezer, and the dasher has a self-adjusting scraper to remove the cream from the side



Fig. 2.

of the can, and the freezer will operate with or without the dasher, as desired. It is an easy adjustment and well made. The Pet is represented in Fig. 2, and is, it will be seen, slightly different in construction. It has also a self-adjusting scraper. The Boss, Fig. 3, is described as a solid, well-



Fig. 3.

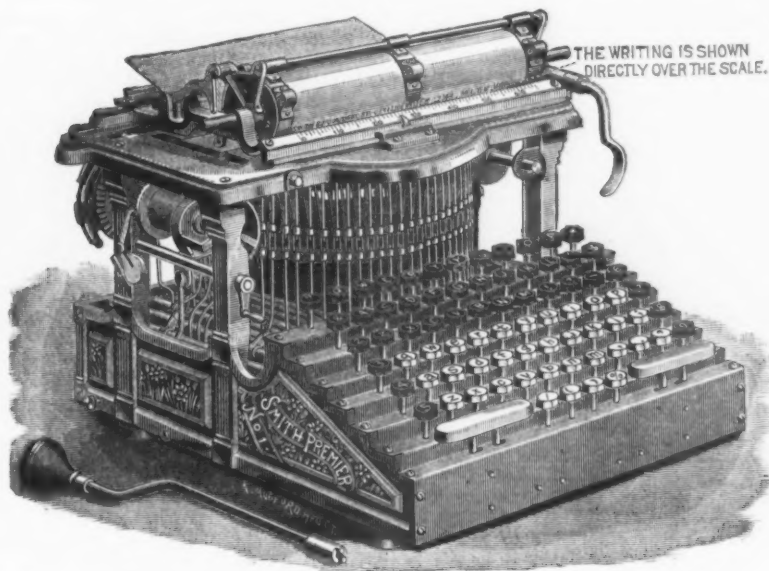
made freezer to meet the demand for a very cheap article and is full size, with self-adjusting scraper to cut the cream from the side of the can. All the above freezers are made in 2, 3, 4 and 6 quart sizes.

The Smith Premier Type-Writer.

One of the latest candidates for public favor in the shape of a type-writing machine is that manufactured and offered to the trade by the Smith Premier Type-Writer Company, of Syracuse, N. Y. This

operated. This is somewhat different from that employed upon the Remington or Caligraph, and consists essentially of a rocking instead of a lever motion. In the engraving 1 is the key with stem, 2 is the rocking shaft, 3 is the connecting rod or wire, and 4 is the type bar. The manu-

carriage is gibbed solidly to the machine, and cannot be raised, as is the case with other type-writers at present on the market. The platen, with its paper-feeding mechanism, which is shown detached in Fig. 5, is mounted upon an auxiliary frame, or cradle, which in turn is carried on the carriage frame, and may be instantly detached from the machine by drawing up the lever shown at the left in Fig. 1 of the illustrations. This enables the operator to remove the platen, with its paper, and to instantly substitute another. The advantage of this arrangement will be readily appreciated by those who desire to change from ordinary work to that of manifolding, and do not wish to remove the paper from the platen. Another feature to which attention is directed is the locking mechanism, by means of which, when the alarm bell rings at five letters from the end of the line, the same as in other type-writers, this machine will print five letters or characters and lock the entire system of keys, so that no additional impressions can be made. This prevents blurring the last word by striking several letters one upon the other, as frequently happens in the use of machines at present well known to the public. The lever for drawing the carriage back from each line of printing projects forward and downward, as indicated at the right in Fig. 1. This lever is attached to a rock-shaft, which extends backward and is neatly incased in the carriage frame. At the opposite end



The Smith Premier Type-Writer.—Fig. 1.—General View of Machine with Platen Drawn Forward to Show the Writing.

machine represents the results of a great deal of study and experimentation, and, we are informed, is built to meet all the requirements of a first-class machine. The manufacturers state that it is thoroughly made of the best materials and finished in the highest style of the art. In the accompanying engravings we present a number

of views which, in connection with the following description, will enable the reader to form a very comprehensive idea of the principal features of construction. In Fig. 1 is shown a general view of the machine, with the platen drawn forward for the purpose of inspecting what has been written. Fig. 2 represents the keyboard employed on this machine. It will be noticed that there are 76 character keys, arranged in straight rows in all directions, and that the shape of the key-board is a rectangle. The lower-case keys are white, while the upper-case letter, numeral and character keys are black. The upper and lower case letters are arranged in the same order, thus facilitating the work and relieving the mind of search for the required character. It will also be noticed that this key-board possesses two space-keys instead of one. The tips of the keys are celluloid and are screwed upon a steel disk, which is riveted to a steel stem. The characters are inlaid in the keys, and are claimed to be thoroughly durable. In Fig. 3 of the engravings is presented the mechanism by which the type is

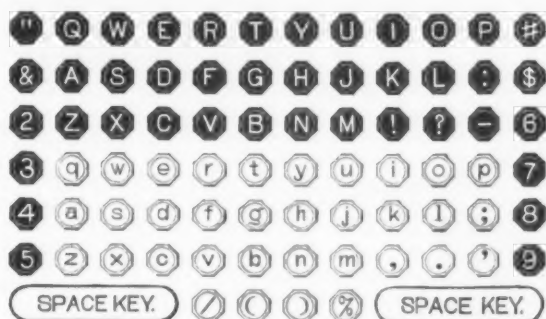


Fig. 2.—The Keyboard.

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operated. This is somewhat different from that employed upon the Remington or Caligraph, and consists essentially of a rocking instead of a lever motion. In the engraving 1 is the key with stem, 2 is the rocking shaft, 3 is the connecting rod or wire, and 4 is the type bar. The manu-

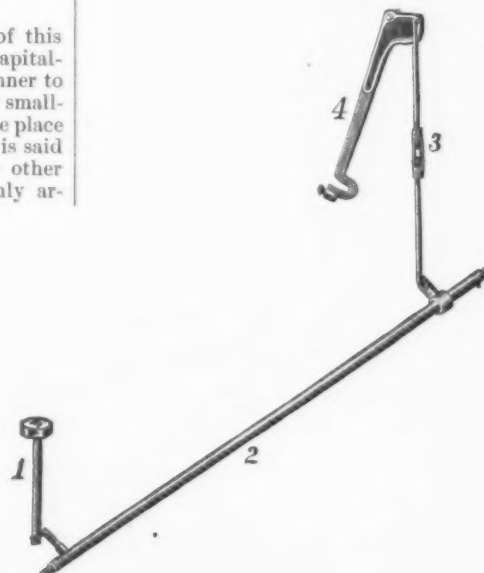


Fig. 3.—Type-Operating Mechanism.

facturers point out that the use of this device enables the upper-case, or capital-letter, keys to be arranged in a manner to exactly duplicate the lower-case, or small-letter, keys, and also to use steel in the place of wood. Every key of the machine is said to have the same leverage as every other key, which is claimed to be the only ar-

range-ment yet known whereby it would be possible to make a double-case type-bar machine with a full complement of keys in so compact a form. As the machine is operated the type bars are brought up between fingers arranged below the

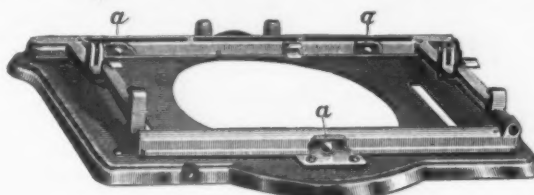
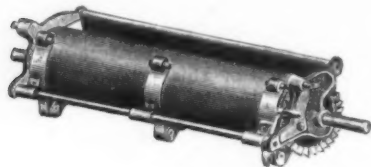


Fig. 4.—The Carriage.

of the rock-shaft is a pawl, which engages with an annular ratchet-wheel. When the lever is pulled downward for the purpose of drawing the carriage back to commence a new line, the shaft is rocked and the pawl at its end turns the platen automatically a single or double line space, as may be desired.

The manner of feeding the ribbon is another important feature to which the manufacturers of this machine direct particular attention. It consists of a compound motion that feeds the ribbon, which is 1 1/2 inches wide, squarely across its width a

each line of printing. When the carriage is drawn back for the purpose of commencing a new line the ribbon is drawn lengthwise about the width of one type. This serves to bring the entire surface of the ribbon into use. It is stated that the time required to transfer or feed the ribbon from one spool to the other in this machine ranges from two to four days of con-



The Smith Premier Type-Writer.—Fig. 5.—
The Platen Detached.

tinuous writing. It is also claimed by thus using the entire surface of the ribbon the color of the written sheet is kept uniform, and the curling of the ribbon, so annoying at times, is entirely avoided. This machine employs but a single scale. In case an error should occur, it appears directly over the scale. The carriage may then be moved until the point for correction is opposite the index, or pointer, when, by returning the platen to the writing position and striking the proper key, the error is quickly and surely corrected.

In Fig. 6 is shown the process of cleaning the type. This, it will be noticed, is a somewhat radical departure, and is a labor-saving device which cannot fail to be appreciated by all who are called upon to use type-writers. In operating this device the work may be left in the machine, and by drawing the platen forward and introducing the crank, as indicated in Fig. 6,

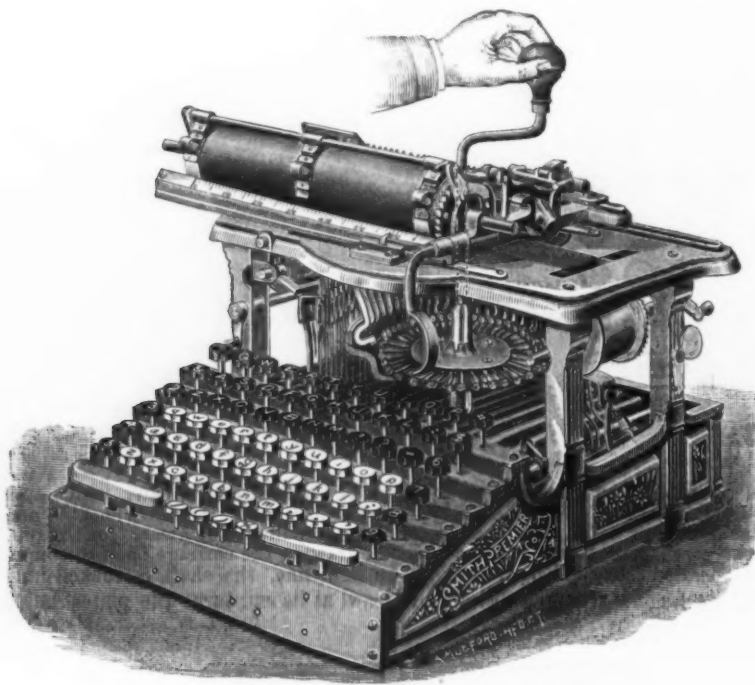


Fig. 6.—Showing Method of Cleaning the Type.

the type may be brushed by giving the crank a few turns in both directions. This rapidly accomplishes the desired result and possesses many advantages over the old process. The type bars of the machine in their normal position form a circle with the type facing inward. Just below is located the cleaning brush, fitted with a threaded shaft, and upon being turned with the detachable crank, shown at the left of machine in Fig. 1, rises up in contact with the type. When the brush is in its normal position it is entirely out of the way of the type bars in writing. Fig. 7

of the engravings shows the brush-wheel removed from the machine and also the crank for operating it.

At the Mannesmann Pipe Works, at Remscheid-Bliedinghausen, Germany, the Mannesmann process of making pipes from solid bars has thus far been applied in manufacturing on a large scale pipes ranging from 0.8 to 8½ inches in outside diameter and up to nearly 20 feet in length. Pipes of smaller diameter have also been turned out, but have not been placed on the market owing to the demand for the larger sizes. Pipes of a larger outside



Fig. 7.—Type-Cleaning Brush and Crank.

diameter than 8½ inches have not yet been made simply because of lack of power at the works. In general, it has been found that with increasing sizes the commercial advantages of the process become more apparent, there being no special mechanical difficulties in manufacturing the larger pipes, while the high speed of rolling, which remains the same for all sizes, makes a larger output possible when handling the large diameters without increasing the working cost. As to the speed

Adjustable Transverse Indicator.

The adjustable transverse indicator here illustrated consists of a cast-iron base, to which is attached an indicator arm of polished brass graduated in $\frac{1}{16}$ inch. At the other end of the stand is a mounted needle beam, proportioned to multiply the deflections ten times, so that $\frac{1}{16}$ on graduated arm represents $\frac{1}{160}$ of deflection of specimen, and by judging of the intervals between marks even finer deflections can be noted. The beam is fitted with narrow adjustment for setting the needle at zero and starting the tests. This



Adjustable Transverse Indicator.

the smallest testing machine. The one we have shown in this illustration was made for the Dennis Long Company, Louisville, Ky., by Riehle Bros., proprietors of the Philadelphia Scale and Testing Machine Works, Ninth and Master streets, Philadelphia.

Chain-Making in England.—In parts of England chain-making is prosecuted to an increasing extent by women and children. During a sitting in London of the House of Lords' Committee representatives of several trades associations testified that frequently one family worked in one workshop and were paid according to the work done, or sometimes at so much per week. These workshops were visited occasionally by the factory inspector, but they were so numerous that they could not be investigated frequently. The iron was given out by weight. Workmen got the material from the masters direct, except in the case of hired workshops. The price received by the middleman who owned and let the shop was often 20 per cent. more than was paid by him to the worker. Generally speaking, the bellows were blown by women, and very hard work it was. Men, women and children, and girls under 18 years of age, worked from 12 to 14 hours a day for four days a week, but not so long on Saturdays and Mondays. Factory inspectors had intervened on a few occasions only. Women and children would earn from 4/ to 6/ per week, and men from 10/ to 12/ or 14/ on common chain.

CURRENT HARDWARE PRICES.

APRIL 24, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	25¢
E. B. Grnd. Edge, Cent. Fire	7½¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	28¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	65¢
Cent. Fire Ground	7½¢
Dbl. Waterproof, 1-10's	1.40
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.00

Cartridges.	
Rim Fire Cartridges	50¢ & 2¢
Rim Fire Military	15¢ & 2¢
Cent. Fire, Flat and Ball	25¢ & 2¢
Cent. Fire, Military and Sporting	15¢ & 2¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.	1.75
Blank Cartridges, 32 cal.	3.50
Primed Shells and Bullets	15¢ & 2¢
B. B. Caps, Round Ball	1.75
B. B. Caps, Con. Ball, Swgd.	2.00
Primers	
Berdan Primers, 1.00	2¢
B. L. Caps (for Sturtevant Shells)	1.00
All other Primers, 1.20	2¢

Shells.	
First quality, 4, 8, 10 and 12 gauge	25¢ & 10¢
First quality, 14, 16 and 20 gauge	30¢ & 10¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	35¢ & 10¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢ & 10¢
Selfbold's Comb. Shot Shells	15¢ & 2¢
Brass Shot Shells, 1st quality	60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax	55¢ & 2¢
I. X. L., 10 and 12 gauge	40¢ & 2¢
"Special" 16 gauge	30¢ & 10¢
"Special" 10 and 12 gauge	40¢ & 10¢
Fowler's Pat.	35¢

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢ & 10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up	2.00
U. M. C. & W. R. A.—B. E., 9x10	2.30
U. M. C. & W. R. A.—B. E., 7x8	2.00
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9x10	4.00
U. M. C. & W. R. A.—P. E., 7x8	4.90
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.80

Anvils.	
Eagle Anvils, 10" & 14"	20¢ & 25¢
Peter Wright's	9¢
Armitage's Mouse Hole	8¢
Armitage's Mouse Hole, Extra 11"	11¢
Trenton	9¢
Wilkinson's	9¢
J. & Riley Carr, Pat. Solid	11¢
Moore & Barnes Mfg. Co.	33¢

Anvil Vise and Drill—	
Millers Falls Co., 218.00	20¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	40¢

Apple Parers—	
Advance	1 doz \$4.75
Antrim Combination	1 doz 5.50
Baldwin	1 doz 5.25
Champion	1 doz 7.25
Eureka, 1888	each 17.00
Family Bay State	1 doz 12.00
Gem	1 doz 5.25
Gold Medal	1 doz 4.00
Hudson's New '88	1 doz 3.75
Ideal	1 doz 4.75
Improved Bay State	1 doz 30.00
Little Star	1 doz 5.00
Monarch	1 doz 13.50
New Lightning	1 doz 5.50
Orion	1 doz 4.00
Pen	1 doz 4.00
Perfection	1 doz 4.00
Pomona	1 doz 4.00
Rocking Table	1 doz 6.00
Turntable	1 doz 4.50
Victor	1 doz 13.50
Waverly	1 doz 4.50
White Mountain	1 doz 4.50
72	1 doz 4.25
76	1 doz 5.75
78	1 doz 6.50

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢ & 10¢
Ives' Circular Lip	60¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 8 set, 32½ quarters, No. 5 & 6, No. 30, 35.50	20¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢ & 10¢
Pugh's Black	20¢
Car Bits	50¢ & 10¢
L. Hommedieu Co. Bits	15¢ & 10¢
Forster Pat. Aug Bits	10¢

Hollow Augers—

Ives'	25¢ & 10¢
French, Swift & Co.	25¢ & 10¢
Douglas'	48¢
Bonney's Adjustable, 1/2 doz	48¢
Stearns'	20¢ & 10¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢ & 10¢

Expansive Bits—

Clarks' small, 1/8; large, 3/8	35¢ & 35¢
Ives' No. 4, 1/2 doz	40¢
Swan's	40¢
Stearns' No. 1, 20; No. 2, 22	35¢
Stearns' No. 2, 48	20¢

Gimlet Bits—

Common	1/2 gross \$2.75 @ \$3.25
Diamond	1/2 doz \$1.10
Bee	25¢ & 25¢
Double Cut, Shepardson's	45¢ & 45¢
Double Cut, Ct. Valley Mfg. Co.	30¢ & 10¢
Double Cut, Hartwell's, 1/2 gross	85¢
Double Cut, Douglas'	40¢ & 10¢
Double Cut, Ives	60¢ & 10¢

Bit Stock Drills—

Morse Twist Drills	50¢ & 10¢
Standard	50¢ & 10¢
Cleveland	50¢ & 10¢
Syracuse, for metal	50¢ & 10¢
Syracuse, for wood (wood list)	30¢ & 10¢
Williams' or Holt's, for metal	50¢ & 10¢
Williams' or Holt's, for wood	40¢ & 10¢

Ship Augers and Bits—

L'Hommiedieu's	15¢ & 10¢
Watrous'	15¢ & 10¢
Snell's	15¢ & 10¢
Snell's Ship Auger Pat'n Car Bits	15¢ & 10¢

Awl Hafts—

Sewing, Brass Fer. 1/2 gr	35.50
Pat. Sewing, Short, 1.00 1/2 doz	40¢ & 10¢
Pat. Sewing, Long, 1.00 1/2 doz	40¢ & 10¢
Pat. Peg, Plain Top, 1/2 gr	12.50
Pat. Peg, Leather Top, 1/2 gr	12.50

Awls, Brad Sets, &c—

Awls, Sewing, Common 1/2 gr	17.00
Awls, Should. Peg, 1/2 gr	24.50
Awls, Pat. Peg, 1/2 gr	63¢
Awls, Shouldered Brad, 2.70 1/2 gr	35¢
Awls, Handled Brad, 1.75 1/2 gr	45¢
Awls, Handled Scratch Peg, 1.75 1/2 gr	35¢ & 10¢
Awls, Socket Scratch, 1.50 1/2 gr	25¢ & 30¢

Awl and Tool Sets—

Alken's Sets, Awls and Tools	
No. 20, 1/2 doz \$10.00	55¢ & 10¢
Fray's Adj. Tool Hds., Nos. 1, 1 1/2, 2, 3	1.12; 2, 1.18; 3, 1.24
Miller's Falls Adj. Tool Hds.	25¢ & 10¢
Nos. 1, 1 1/2, 2, 3	1.12; 2, 1.18; 3, 1.24
Henry's Combination Haft	1/2 doz \$6.50
Brad Sets	
No. 42, 10.50; No. 43, 12.50	70¢ & 10¢
Stearns' Extension	
No. 1, 87.50; No. 2, 44.00; No. 3, 85.50	30¢ & 10¢

Axes—

Makers' and Special Brands—	
First quality	1/2 doz \$6.00 @ \$6.50
Others	1/2 doz \$5.50 @ \$5.75

Axle Grease—

Fraser's	1 Keg 1/2 doz 4¢, 1/2 doz 5¢
Fraser's, in boxes	1/2 doz \$9.50
Fraser's Everlasting, in bxs.	1/2 doz 11¢
Dixon's Everlasting	10-lb pails, ea. 85¢
Lower grades, special brands	1/2 doz \$5.50 @ \$7.00

Axles—

No. 1	4¢ @ 4 1/2¢, No. 2 5 1/2¢ @ 5 1/2¢
Nos. 7 to 14	55¢ & 5¢
Nos. 15 to 18	47¢
Nos. 19 to 22	47¢
National Tubular Self-Oiling Standard	
Farm (1 to 5) and Special Farm (A1 to A5)	
Less than 10 sets	33¢ & 35¢
Over 10 sets	33¢ & 35¢

Bag Holders—

Spengle's Pat.	1/2 doz \$18.00
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Balances—

Spring Balances	50¢
Common 24-lb	1/2 doz \$1.50
Chattillon's Spring Balances	50¢
Chattillon's Circular Spring Balances	60¢

Bells—

Hand—	
Light Brass	70¢ & 10¢
Extra Heavy	60¢ & 10¢
White Metal	60¢ & 10¢
Silver Chime	33¢ & 10¢
Globe (Cone's Patent)	25¢ & 10¢

Door—

Gong, Abbe's	33¢ & 10¢
Gong, Yankee	45¢ & 10¢
Gong, Barton's	40¢ & 10¢
Crane, Taylor's	25¢ & 10¢
Crane, Brooks'	50¢ & 10¢
Crane, Cone's	10¢

Crank, Connel's	20¢ & 10¢
Lever, Sargent's	60¢ & 10¢
Lever, Taylor's Bronzed or Plated	25¢ & 10¢
Lever, Taylor's Japanned	25¢ & 10¢
Lever, R. E. M. Co.'s	50¢ & 10¢
Pull, Brooks'	50¢ & 10¢
Pull, Western	25¢ & 10¢

Coir—

Common Wrought	60¢ & 10¢
Western	20¢ & 10¢
Western, Sargent's list	70¢ & 10¢
Kentucky, "Star"	20¢ & 10¢
Kentucky, Sargent's list	70¢ & 10¢
Dodge, Genuine Kentucky	70¢ & 10¢
Texas Star	50¢ & 10¢
Canton's	40¢ & 10¢
Farm Belts	1/2 doz 3¢ @ 3 1/2¢
Steel Alloy Church and School Bells	40¢

Bellows—

Blacksmiths'	50¢ & 10¢
Molders	40¢ & 10¢
Hand Bellows	40¢ & 10¢

Belted, Rubber—

Common Standard	70¢ & 10¢
Standard	70¢ & 10¢
Extra	60¢ & 10¢
N. Y. B. & P. Co., Carbon	60¢ & 10¢
N. Y. B. & P. Co., Diamond	50¢ & 10¢

Bench Stops—

Morrill's	1/2 doz \$9.50
Hotchkiss's	1/2 doz \$5.10 @ \$10.10
Weston's, No. 1, 210; No. 2, 89.25	10¢ & 5¢
McGill's	1/2 doz \$3.10

Bits—

Auger, Gimlet, Bit Stock, Drills, &c.	
see Augers and Bits.	

Bit Holders—

Extension	
Barber's, 1/2 doz \$15.00	40¢ & 40¢
Ives, 1/2 doz \$20.00	60¢ & 60¢
Diagonal	1/2 doz \$24.00, 40¢
Angular	1/2 doz \$24.00, 40¢ & 5¢

Blind Adjusters—

Domestic	1/2 doz \$3.00, 33¢
Excelsior	1/2 doz \$10.00
Washburn's Self-Locking	20¢ & 20¢

Blind Fasteners—

Mackrell's, 1/2 doz, 1.00	20¢ & 20¢
Van Sand's Screw Pat., 15¢ 1/2 gr	60¢ & 10¢
Van Sand's Old Pat., 15¢ 1/2 gr	55¢ & 10¢
Washburn's Old Pattern, 1/2 gr	80¢
Merriman's	1/2 doz \$9.00
Austin & Eddy No. 2008, 1/2 gr	80¢
Security Gravity, 1/2 gr	90¢

Blind Staples—

Barbed, 1/2 in. and larger	7 1/2¢ @ 8¢
Barbed, 3/4 in.	8 1/2¢ @ 9¢

Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢ & 70¢
Cast Iron Shutter Bolts	70¢ & 70¢
Cast Iron Chain (Sargent's list)	65¢ & 10¢
Ives' Patent Door Bolts	60¢
Wrought Barrel	70¢ & 70¢
Wrought Square	70¢ & 70¢
Wrt Shutter, all Iron, Stanley's	60¢ & 10¢
Wrt Shutter, Brass Knob	40¢ & 10¢
Wrt Shutter, Sargent's list	60¢ & 10¢
Wrt Sunk Flush, Sargent's list	55¢ & 10¢
Wrt Sunk Flush, Stanley's list	50¢ & 10¢
Wrt B.K. Flush, Com'n	55¢ & 10¢

Carriage, Machine, &c.—

Com. list June 10, '84	75¢ & 10¢
Genuine Eagle, list Oct. '84	75¢ & 10¢
Phila. pattern, list Oct. 7, '84	75¢ & 10¢
R.B. & W., old list	70¢
Machine, according to size	75¢ & 10¢
Bolt Ends, according to size	75¢ & 10¢

Tire—

Common, list Feb. 28, '83	70¢
Port Chester Bolt and Nut Company	
Empire, list Feb. 28, '83	70¢
Phila., list Oct. '84	82¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢ & 10¢
Norway, Phil., list Oct. 16, '84	75¢ & 10¢
Eagle, Phil., list Oct. 16, '84	80¢
Phila., list Oct. 16, '84	82¢
Bay State, list Feb. 28, '83	75¢
R.B. & W., Philadel., list Oct. 16, '84	82¢

Store and Plow—

Stove	65¢
Plow	60¢ & 5¢
R. B. & W., Plow	55¢

Borax—

Without	1/2 doz \$9.00 @ 10¢
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Boring Machines—

Without	
Augers, Upright, Angular	
Douglas	\$5.50 @ \$6.75
Snell's, Rice's Pat.	5.50 6.75
Jennings	5.50 6.75
Other Machines	2.35 2.75

Cards—

Horse & Curry.....10&10&10&10&10
Cotton.....10&10&10
Wool.....10&10&10

Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25
Cast Iron, Steel Polats.....\$ doz \$2.00
Socket.....\$ doz \$1.75
Hullard's.....25&25&10

Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00
Bissell No. 7 New Drop Pan.....\$ doz \$19.00
Bissell, Grand.....\$ doz \$36.00
Grand Rapids.....\$ doz \$24.00
Crown Jewel, No. 1.....\$18.00; No. 2, \$20.00
Magie.....\$ doz \$15.00
Jewel.....\$ doz \$17.00
Improved Parlor Queen.....\$ doz \$27.00
Nickel.....\$ doz \$24.00
Japanned.....\$ doz \$22.00
Excelsior.....\$ doz \$18.00
Garland.....\$ doz \$15.00
Parlor Queen.....\$ doz \$15.00
Housewife's Delight.....\$ doz \$15.00
Queen.....\$ doz \$16.00
Queen, with band.....\$ doz \$18.00
King.....\$ doz \$30.00
Weed, Improved.....\$ doz \$18.00
Hub.....\$ doz \$15.00
Cog-Wheel.....\$ doz \$16.00
Conqueror.....\$ doz \$22.00
Easy.....\$ doz \$22.00
Monarch.....\$ doz \$22.00
Goshen.....\$ doz \$21.00
Advance.....\$ doz \$18.00
Ladies' Friend, No. 1.....\$ doz \$15.00; No. 2, \$16.00
American.....\$ doz \$15.00
Grand Republic.....\$ doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....\$ Brass.....55&55&55
Plate.....\$ Others.....60&60&55
Shallow Socket.....40&10
Deep Socket.....30&10
Yale Casters, list May, 1888.....30&10
Yale, Gem.....60&60&55
Martin's Patent (Phoenix).....45&10
Payson's Anti-friction.....60&60&10
Giant Truck Casters.....30
Stationary Truck Casters.....50&10
Socket Truck Casters.....50

Cattle Leaders—

Humason, Beckley & Co.'s.....70
Sargent's.....60&10
Hotchkiss.....30
Peck, Stow & W. Co.....50&10

Chain—

Trace, 6-10-2, exact.....50&10&50&10&55
Trace, 6-10-3, exact.....50&10&50&10&55
Trace, 7-10-2, exact.....50&10&50&10&55
Trace, 7-10-1, exact.....50&10&50&10&55
NOTE.—Traces, "Regular" sizes, 3¢ net
Log, Fifth, Stretcher, and other fancy
Chains, list Nov. 1, 1888

American Coil, in cask lots,
3-16 5-16 3-7 7-16 5-8 3-5
\$8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add 1/4¢ @ 1/2¢
German Coil, list of June 20, 1887
German Halter Chain, list of June 20,
1887.....50&10&50&60
Covert Halter, Hitching and Breast
50&25
Covert Traces.....35&25
Oneida Halter Chain.....35&25
Galvanized Pump Chain.....50&10
Jack Chain, Iron.....75&75&55
Jack Chain, Brass.....70&70&55

Chalk—

White.....\$ gr 50¢
Blue.....\$ gr 70¢
See also Crayons.

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer,
P. S. & W.....75&5&75&10
New Haven.....75&5&75&10
Witherby.....75&5&75&10
Mix.....75&5&75&10
Ohio Tool Co.....75&5&75&10
Douglass.....75&5&75&10
Buck Bros.....75&5&75&10
Merrill.....75&5&75&10
L. & I. J. White.....30&30&55

Tanged and Miscellaneous.

Tanged Firmers.....40&10
Butchers.....\$4.75&\$5.00
Spear & Jackson's.....\$5 to \$2
Buck Bros.....30
Cold Chisels, \$ B.....16&19

Chucks—

Beach Pat.....each, \$8.00.....20
Morse's Adjustable, each, \$7.00, 20&20&55
Danbury.....each, \$6.00, 30&30&55
Syracuse, Bais Pat.....25

Clamps—

R. I. Tool Co.'s Wrought Iron.....25
Adjustable, Gray's.....20
Adjustable, Lambert's.....20
Adjustable, Snow's.....40&5
Adjustable, Hammers.....15
Adjustable, Stearn's.....20&10
Stearn's Adjustable Cabinet and Cor-
ner.....20&10
Cabinet, Sargent's.....60&10
Carriage Makers, Sargent's.....70&10
Eberhard Mfg. Co.....40&5&40&10
Warner's.....40&10&40&10&55
Saw Clamps, see Vises

Clips—

Norway, Axle, 1/4 & 5-16.....55&55
2nd grade Norway Axle, 1/4 & 5-16.....55&55
Superior Axle Clips.....60&55
Norway Spring Bar Clips, 5-16, 60&55
Wrought Iron Felloe Clips.....\$ B, 5¢
Steel Felloe Clips.....\$ B, 5¢
Baker Axle Clips.....25

Cockeyes.

Cocks, Brass.....50
Hardware list.....40, & 10&25

Coffee Mills—

Box and Side, List Jan. 1, 1888.....50&25
American, Enterprise Mfg Co. 20&10&30
The Swift, Lane Bros.....20&10

Compasses Dividers, &c—

Compasses, Calipers, Dividers, 70&70&10
Bemis & Call Co.'s.....50&55
Dividers.....50&55
Compasses & Calipers.....50&55
Wing and Inside or Outside.....50&55
Double.....60
(Call's Pat. Inside).....30
Excelsior.....50
J. Stevens & Co.'s.....25&10
Starrett's.....25&10
Spring Callipers and Dividers 25&10&10
Lock Callipers and Dividers.....25&10
Combination Dividers.....25&10

Coopers' Tools—

Bradley's.....20
Barton's.....20
L. & J. White.....20&55
Albertson Mfg. Co.....25
Beatty's.....30
Sandusky Tool Co.....30&30&55

Corkscrews—

Humason & Beckley Mfg. Co. 40&40&10
Clough's Pat.....33&55&55
Howe Bros & Hulbert.....35

Cork Knives and Cutters—

Bradley's.....10
Wadsworth's.....25

Cradles—

Grain.....50&25

Crayons.

White Crayons, \$ gr 12¢ @ 12¢.....10
M. S. Mfg. Co. Metal Workers, \$ gr,
\$2.50.....25
M. S. Mfg. Co., Rolling Mill, \$ gr,
\$2.50.....25
See also Chalk.

Crow Bars—

Cast Steel.....\$ B, 4¢
Iron, Steel Points.....\$ B, 3¢

Curry Combs—

Fitch's.....50&10&50&10&10
Rubberper doz \$10.00.....20
Perfect.....50

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33
Wostenholme.....\$7.75 to \$2

Dampers, &c—

Dampers, Buffalo.....50
Buffalo Damper Clips.....50
Crown Damper.....40
Excelsior.....40&10

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list
30&10
Leather, Pope & Steven's list.....40
Brass, Pope & Steven's list.....40

Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30
Gray's, \$ gr., \$20.00.....20
Bee Rod \$ gr., \$20.00.....20
Warner's No. 1, \$ doz, \$2.50; No. 2,
\$3.30.....40&10&50
Gem (Coll), list April 19, 1888.....10
Star (Coll), list April 19, 1888.....20
Victor (Coll).....60&60&10
Champion (Coll).....60&60&10
Philadelphia, 5 in., \$5.00; 3 in., \$7.75
Cowell's.....No. 1, \$ doz, \$18.00; No. 2,
\$15.00.....50
Rubber, complete, \$ doz, \$4.50.....55&10
Hercules.....50
Shaw Door Check and Spring, 25&30&35

Drawing Knives—

Witherby.....75&5
P. S. & W.....75&10
New Haven.....75&5
Merrill.....60&10
Douglass.....75&5
Watrous.....15&10
L. & I. J. White.....20&5
Bradley's.....25
Adjustable Handle.....25
Wilkinson's Folding.....25&55

Drills and Drill Stocks—

Blacksmiths' Self-Feeding, each \$7.50, 20
Breast, P. S. & W.....40&10
Breast, Wilson's.....30&5
Breast, Millers Falls.....each \$3.00, 25
Breast, Bartholomew's.....each \$2.50, 25
Ratchet, Merrill's.....20&20&55
Ratchet, Ingersoll's.....25
Ratchet, Parker's.....20&20&55
Ratchet, Whitney's.....20&10
Ratchet, Weston's.....20&25
Ratchet, Moore's Triple Action.....25
Whitney's Hand Drill, Plain, \$11.00;
Adjustable, \$12.00.....20&10
Wilson's Drill Stocks.....\$1.75 to \$1.85
Automatic Boring Tools.....\$1.75 to \$1.85

Twist Drills—

Morse.....50&10&55
Standard.....50&10&55
Syracuse.....50&10&55
Cleveland.....50&10&55
Williams.....50&10&10
New Process.....50&10&55

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....\$ B, 6¢
Large sizes.....\$ B, 6¢

Egg Beaters.

Dover.....\$ doz \$1.50
National.....\$ doz \$4.50
Family (T. & S. Mfg. Co.), \$ gro \$17.00;
\$18.00
Duplex (Standard Co.).....\$ gro \$15.00
Rival (Standard Co.).....\$ gro \$12.00
Large Duplex (Standard Co.), \$ doz \$4.50
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1.....\$ gro \$10.50
Advance, No. 2.....\$ gro \$10.00
Bryant's.....\$ gro \$15.00
Spiral.....\$ gro \$5.00
Double (H. & R. Mfg. Co.).....\$ gro \$18.20
Easy (H. & R. Mfg. Co.).....\$ gro \$14.00
Triple (H. & R. Mfg. Co.).....\$ gro \$16.20
Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50
Paine, Diehl & Co.'s.....\$ gro \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No.
1, \$6.00; No. 2, \$9.00.....25

Electric Bell Sets—

Wollensak's.....20
Bigelow & Dowse.....20

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F F F.
Kegs, \$ B.....4¢ 5¢ 2¢
5¢ 5¢ 2¢
10 lb cans, 10 5¢ 3¢
in case.....6¢ 6¢ 5¢
10-means, less than 10.....10¢ 10¢ 7¢

Enameled and Tinned Ware—

See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1888.....50&10&50&10&55
Brass.....60&60&55

Escutcheons.

Door Lock.....Same dis as Door Locks.
Brass Thread.....\$0.00 to \$0.10
Wood.....25

Faucets.—

Fenn's.....40
Bohren's Pat. Rubber Ball.....25
Fenn's Cork Stops.....33
Star.....60
Frary's Pat. Petroleum.....40&55
B. & L. B. Co.....50
West's Lock, Open and Shut Key.....50
Star Metal Plug, new list.....40
Lockport, Metal Plug, reduced list.....60
Metallic Key, Leather Lined.....60&10&10
Cork Lined.....70&55&70&10
Burnside's Red Cedar, bbl lots.....60&10
John Sommers'.....40
Peerless Best Block Tin Key.....40
IXL, 1st quality, Cork Lined.....50
Diamond Lock.....40
Perfection, F. B. Red Cedar.....50
Goodenough Cedar.....50
Boss Metallic Key.....50
Reliable Cork Lined.....60
Western Pattern Cork Lined.....50

Self-Measuring

Enterprise, \$ doz \$50.00.....20&10
Lane's, \$ doz \$30.00.....25&10
Victor, \$ doz \$30.00.....25&10

Felloe Plates.

Derby and Cincinnati.....4¢ & 7¢

Fifth Wheels.

Derby and Cincinnati.....4¢ & 7¢

Files—

Domestic.....60&10&60&10
Nicholson (X. F.) Files.....10&55
Nicholson (X. F.) Files.....25
Nicholson's Royal Files (Seconds).....75
(extra prices on certain sizes)
Other makers, best brands.....60&10&60&10&10
Fair brands.....60&10&60&10&10
Second quality.....70&10&60&75&10
Nicholson's Horse Rasps.....60&10&60&10
Heller's Horse Rasps.....50&75&50&10
McCaffrey's Horse Rasps.....50&10

Imported—

J. & Riley Carr.....List, April 1, 1883, 15¢
J. & Riley Carr Horse Rasps.....10¢
Moss & Gamble.....List, April 1, 1883, 15¢
Butcher.....Butcher's list, 20¢
Stubbs.....Stubbs list, 25¢
Turton's.....Turton's list, 20¢
Greaves' Horse Rasps.....American list, 60¢

Fluting Machines—

Knox, 4 1/2-inch Rolls.....\$3.25 each 35¢
Knox, 6-inch Rolls.....\$3.60 each 35¢
Eagle, 3 1/2-inch Roll, \$2.15.....25&10
Eagle, 5 1/2-inch Roll, \$2.85.....35¢
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$6.50 each.....35¢
Crown Jewel, 6 in.....\$3.50 each, 35¢
American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....35¢
Domestic Fluter.....each, \$1.50
Geneva Hand Fluter, White Metal.....\$ doz \$12, 25¢
Crown Hand Fluter, Nos. 1, \$15.00; 2,
\$12.50; 3, \$10.00.....30
Shepard Hand Fluter, No. 85 \$ doz
\$15.30.....40
Shepard Hand Fluter, No. 110 \$ doz
\$11.00.....40
Shepard Hand Fluter, No. 95 \$ doz
\$5.00.....40
Shepard's Hand Fluter.....\$ doz \$15.00.....35
Combined Fluter and Sad Iron.....\$ doz \$15.00.....30
Buffalo.....\$ doz \$10.00.....10

Fluting Scissors—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.25

Fodder Squeezers—

Blair's.....\$ doz \$2.00
Blair's "Climax".....\$ doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65¢
Hay, Manure, &c., Phila. List 60¢ @ 60¢ & 55¢
Pated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60&10&55
Shepard's Lightning......65 @ 65¢ & 55¢
White Mountain.....50&20&55
New Arctic.....50&40&55
American.....60
Gem.....65
Blizzard.....70
Double Action Crown.....60
Crown.....60
Star.....60
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....55&10&10

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10&30
Hens.....\$ doz \$3.75&\$4.00
P. D. & Co.....\$ doz \$3.75&\$4.00
Shepard's Queen City.....40

Fry Pans—

High List.....75&55&75&10
No.....0 1 2 3 4
\$ doz.....\$3.75 \$4.70 \$5.30 \$6.95 \$6.55
No.....5 6 7 8
\$ doz.....\$7.50 \$8.75 \$10.00 \$11.25

Low List—

No.....0 1 2 3 4
\$ doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
\$ doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground, \$2.70
Common Cotton Fuse, for dry ground, 2.85
Single Taped Fuse, for wet ground, 4.25
Double Taped Fuse, for very wet ground, 5.40
Triple Taped Fuse, for very wet ground, 6.50
Small Gutta Percha Fuse, for water, 7.50
Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60&10
Starrett's Surface, Center and Scratch,
25&10
Wire, low list.....10&10
Wire, Wheeler, Madden & Co.....10
Wire, Morse's.....50&50&55
Wire, Brown & Sharpe's.....10&20

Gimlets—

Nail and Spike.....50&10&55
"Eureka" Gimlets.....40&10
"Diamond" Gimlets.....\$ gr \$5.00
Double Cut, Sheppardson's.....45&45&55
Double Cut, Ives'.....60&60&55
Double Cut, Douglass.....40&10
"Bee," \$ gr \$12.....25&25&55

Glue—

Le Page's Liquid.....25&25&55
Upton's Liquid.....35
Le Page & Co.'s Improved Process.....25&25&55

Glue Pots—

Tinned.....40
Enameled.....40&55
Family, Howe's "Eureka".....40
Family, L. F. C.'s "Handy".....50

Grindstones—

Small, at factory.....\$ on \$7.50 to \$9.00

Grindstone Fixtures—

Sargent's Patent.....70&10
Reading Hardware Co.....30&10

Hack Saws.—

See Saws.

Halters—

Covert's, Rope, 1/4-in. Jute.....50&25
Covert's, Rope, 1/2-in. Hemp.....40&25
Covert's Adl. Rope Halters.....40&25
Covert's Hemp Horse and Cattle Tie.....50&25
Covert's Jute Horse and Cattle Ties.....60&10&25

Hammers—

Handled Hammers.....25&25&10
Maydole's, list Dec. 1, '85.....25&25&10
Buffalo Hammer Co., list Jan. 15, '87
Humason & Beckley.....50&50&10
Atha Tool Co.....40&10&60
Fayette R. Plumb.....40&10&50
C. Hammond & Son.....40&10&50
Verree.....55
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 &
1.75.....30&10
Nelson Tool Works.....40&10
Warner & Nobles.....20&25
Peck, Stow & Wilcox.....40
Sargent's.....35&10

Heavy Hammers and Sledges—

3 lb and under.....\$ B, 40¢ 60&10
3 to 5 lb.....\$ B, 30¢ 40&10
Over 5 lb.....\$ B, 30¢ 40&10
Wilkinson's Smiths.....10¢ @ 11¢

Handcuffs and Leg Irons—

R. I. Tool Co., Handcuffs, \$15.00 \$ doz 10¢
R. I. Tool Co., Leg Irons, \$25.00 \$ doz 10¢
Tower's.....25
Daley's Improved Handcuffs: 2 Hands,
Polished, \$ doz \$48.00; Nickle,
\$57.00; 3 Hands, Polished, \$ doz
\$72.00; Nickle, \$84.00.....25

Handles—

Iron, Wrought or Cast—

Door or Thumb.....0 1 2 3 4
Nos.....0 1 2 3 4
Per doz.....\$0.90 1.00 1.18 1.35 1.50

Roggin's Latches.....\$ doz 30¢ @ 35¢
Bronze Iron Drop Latches.....\$ doz 70¢ net
Jap'd Store Door Handles—Nuts, \$1.02;
Plate, \$1.10; no Plate, \$0.88.....net
Barn Door, \$ doz \$1.40.....10&10
Chest and Lifting.....70

Handles, Wood—

Saw and Plane.....40&10&40&10&55
Hammer, Hatchet, Axe, Sledge, &c.....40
Brax Awl.....\$ gr \$2.00
Hickory Firmer Chisel, large, \$ gr \$5.00
Apple Firmer Chisel, ass'd.....\$ gr \$5.00
Apple Firmer Chisel, large.....\$ gr \$6.00
Socket Firmer Chisel, ass'd.....\$ gr \$3.00
Socket Framing Chisel, ass'd.....\$ gr \$5.00
J. S. Smith & Co.'s Pat

Cross-Cut Saw Handles—
 Atkins' No. 1 Loop, # pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
 Boynton's Loop Saw Handles, 50¢.
 Champion, 15¢.

Hangers—
 Barn Door, old patterns, 60¢ to 10¢ to 70¢.
 Barn Door, New England, 60¢ to 10¢ to 70¢.
 Samson Steel Anti-Friction, 55¢.
 Orleans Steel, 55¢.
 Hamilton Wrought Wood Track, 55¢.
 U. S. Wood Track, 65¢.
 Champion, 60¢ to 10¢.
 Rider and Wooster, Medina Yfg. Co.'s, 50¢.
 list, 50¢.
 Climax Anti-Friction, 60¢.
 Climax Anti-Friction for Wood Track, 55¢.
 Zenith for Wood Track, 55¢.
 Reed's Steel Arm, 50¢.
 Challenge, Barn Door, 50¢.
 Sterling's Imp'vd (Anti-Friction) 65¢ to 10¢.
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00, 50¢ to 2¢.
 Cheritree, 50¢ to 10¢.
 Kidder's, 50¢ to 10¢ to 60¢.
 The Boss, 60¢ to 10¢.
 Best Anti-Friction, 60¢ to 10¢.
 Duplex (Wood Track), 60¢ to 10¢ to 5¢.
 Terry's Pat., # doz pr. 4 in, \$10.00; 5 in, \$12.00, 50¢ to 5¢ to 10¢.
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00, 50¢ to 10¢ to 5¢.
 Wood Track Iron Clad, # ft. 10¢, 50¢ to 10¢ to 5¢.

Carrier Steel Anti-Friction, 50¢ to 5¢ to 10¢.
 Architect, # set \$6.00, 20¢ to 10¢.
 Fellix, # set \$4.50, 30¢ to 10¢.
 Richards, 30¢ to 10¢ to 5¢.
 Lane's Steel Anti-Friction, 40¢ to 10¢.
 Ball Bearing Door Hanger, 20¢ to 10¢ to 5¢.
 Warner's Pat., 20¢ to 10¢ to 5¢.
 Stearns' Anti-Friction, 20¢ to 10¢ to 5¢.
 Stearns' Challenge, 25¢ to 10¢ to 5¢.
 Faulstich, 40¢ to 10¢ to 5¢.
 American, # set \$6.00, 30¢ to 10¢ to 5¢.
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢, 40¢ to 10¢ to 5¢.
 Paragon, Nos. 1, 2 and 3, 40¢ to 10¢ to 5¢.
 Paragon, Nos. 5, 5½, 7 and 8, 50¢ to 10¢ to 5¢.
 Crescent, 60¢ to 10¢ to 5¢.
 Nickel, Cast Iron, 50¢.
 Nickel, Malleable Iron and Steel, 40¢.
 Seranton Anti-Friction Single Strap, 33¢.
 Seranton Anti-Friction Double Strap, 40¢.
 Universal Anti-Friction, 40¢.
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00, 40¢ to 10¢ to 5¢.
 Star, 40¢ to 10¢ to 5¢.
 May, 50¢ to 10¢ to 5¢.
 Barry, \$6.00, 40¢ to 10¢.

Harness Snaps—
 See Snaps.
Hatchets—
 List Jan. 1, 1886, 35¢ to 40¢.
 Isaiah Blood, 35¢ to 40¢.
 Hunt's Shingling, Lath and Claw, 40¢ to 5¢.
 Hunt's Broad, 40¢ to 10¢ to 5¢.
 Buffalo Hammer Co., 40¢ to 10¢ to 5¢.
 Hurd's, 40¢ to 10¢ to 5¢.
 Fayette R. Plumb, 40¢ to 10¢ to 5¢.
 Wm. Mann, Jr., & Co., 50¢ to 5¢ to 10¢.
 Underhill Edge Tool Co., 40¢ to 10¢ to 5¢.
 Underhill's, Baines and Bright, 35¢.
 C. Hammond & Son, 40¢ to 10¢ to 5¢.
 Simmons', 40¢ to 10¢ to 5¢.
 Peck's, 40¢ to 10¢ to 5¢.
 Kelly's, 50¢ to 10¢ to 5¢.
 Sargent & Co., 50¢ to 10¢ to 5¢.
 Ten Eyck Edge Tool Co., 40¢ to 10¢ to 5¢.
 Collins, 10¢.
 Schulte, Loboff & Co., 50¢ to 10¢ to 5¢.

Nails and Straw Nails—
 Lightning, Mfrs. price # doz \$18.00, 25¢.
 But jobbers frequently give extras.
 Gem, 40¢ to 10¢ to 5¢.
 Wadsworth's, 40¢ to 10¢ to 5¢.
 Carter's Needle, # doz \$11.50 to \$12.00.
 Heath's, # doz \$13.50 to \$14.00.
 Auburn Hay, Com. and Spear Point, 40¢.
 Auburn, Straw, 40¢ to 10¢ to 5¢.
 Nolin's Hay, # doz \$10.00.

Hinges—
Wrought Iron Hinges
 Strap and T, 75¢ to 5¢ to 10¢.
 Screw Hook and T, 6 to 12 in., # doz, 34¢.
 Strap, 14 to 20 in., # doz, 34¢.
 Strap, 22 to 36 in., # doz, 24¢.
 Heavy Welded, 6 to 12 in., # doz, 34¢.
 Hook, 14 to 20 in., # doz, 34¢.
 Hook, 22 to 36 in., # doz, 24¢.
 Screw Hook, ½ in., # doz \$1.50; 1 in., # doz \$2.45; 1 ½ in., # doz \$3.80, 10¢ to 5¢ to 10¢.
 Rolled Blind Hinges, Nos. 32 and 34, 50¢ to 10¢ to 5¢.
 Rolled Blind Hinges, Nos. 232 and 234, 55¢ to 10¢ to 5¢.
 Rolled Plate, 70¢ to 10¢ to 5¢.
 Rolled Raised, 70¢ to 10¢ to 5¢.
 Plate Hinges 8, 10 & 12 in., # doz, 55¢.
 "Providence" over 12 in., # doz, 45¢.

Spring Hinges—
 Geer's Spring and Blank Butts, 40¢.
 Union Spring Hinge Co.'s list, March, 1886, 20¢.
 Acme and U. S., 30¢.
 Empire and Crown, 30¢.
 Hero and Monarch, 30¢.
 American, Gem, and Star, Bronzed, 20¢.
 Oxford, Bronze and Brass, net.
 Barker's Double Acting, 20¢ to 10¢ to 5¢.
 Union Mfg. Co., 25¢.
 Bommer's, 15¢ to 20¢ to 5¢.
 Buckman's, 15¢ to 20¢ to 5¢.
 Chicago, 30¢.
 Wiles', 10¢ to 15¢ to 5¢.
 Devor's, 40¢.
 Rex, 40¢.
 Royal, 60¢.
 Reliable, 60¢.
 Champion, 60¢.

Gate Hinges—
 Western, # doz \$4.40, 60¢.
 N. E., # doz \$7.00, 55¢.
 N. E. Reversible, # doz \$5.20, 50¢ to 10¢ to 5¢.
 Clark's, Nos. 1, 2, 3, 60¢ to 10¢ to 5¢.
 N. Y. State, # doz \$5.00, 55¢ to 10¢ to 5¢.
 Automatic, # doz \$12.50, 50¢.
 Common Sense, # doz pair \$4.50, 50¢.
 Seymour, 45¢ to 10¢ to 5¢.
 Shepard's, 60¢ to 10¢ to 5¢.
 Reed's Latch and Hinges, # doz \$12.00, 60¢.

Blind Hinges—
 Parker, 75¢ to 2¢.
 Palmer, 50¢ to 5¢ to 10¢.
 Seymour, 70¢ to 2¢.
 Nicholson, 45¢ to 10¢ to 5¢.
 Huffer, 50¢.

Clark's, Nos. 1, 3, 5, 40 and 50, 75¢ to 10¢ to 5¢ to 10¢.

Clark's Mortise Gravity, 50¢.
 Sargent's, Nos. 1, 3, 5, 11, 13, 75¢ to 10¢ to 5¢ to 10¢.
 Sargent's, No. 12, 77¢ to 10¢ to 5¢.
 Reading's Gravity, 75¢ to 10¢ to 5¢.
 Shepard's, 75¢ to 10¢ to 5¢.
 Noiseless, 75¢ to 10¢ to 5¢.
 Niagara, 80¢ to 2¢.
 Buffalo, 80¢ to 2¢.
 Clark's Genuine Pat., 80¢ to 2¢.
 O. S., Lull & Porter, 75¢ to 10¢.
 Acme, Lull & Porter, 75¢ to 10¢.
 Queen City Reversible, 75¢ to 10¢.
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3, 75¢ to 10¢ to 5¢ to 10¢.

North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50, 25¢ to 2¢.

Hoes—

Handled—

Garden, Mortar, &c., 65¢.
 Planter's, Cotton, &c., 65¢.
 Warren's Hoe, 60¢.
 Magic, # doz \$4.00.

Eye—

D. & H. Scovill, 20¢.
 Lane's Crescent Planter's Pattern, 45¢ to 5¢.
 Lane's Razor Blade, Scovill Pattern, 30¢.
 Maynard, S. & O. Pat., 45¢ to 5¢.
 Sandusky Tool Co., S. & O. Pat., 60¢.
 Hubbard & Co., S. & O. Pat., 60¢.
 Chattanooga Tool Co., S. & O. Pat., 60¢.
 Grub, 60¢ to 10¢ to 5¢.

Hog Rings and Rings—

Hill's Improved Rings, # doz \$4.25.
 Hill's Old Style Rings, # doz \$2.75.
 Hill's Tongs, # doz \$4.50.
 Hill's Rings, # doz bxs \$2.15 to \$2.25.
 Perfect Rings, # doz bxs \$1.60 to \$1.70.
 Perfect Rings, # doz \$2.15 to \$2.25.
 Blair's Hog Rings, # doz \$2.25 to \$2.50.
 Blair's Hog Rings, # doz \$2.00 to \$2.10.
 Champion Rings, # doz \$2.00.
 Champion Rings, Double, # doz \$2.25.
 Brown's Rings, # doz \$2.00.
 Brown's Rings, # doz \$1.25 to \$1.50.

Holisting Apparatus—

Moore's Hand Holist, with Lock, 20¢.
 Brake, 20¢.
 Moore's Differential Pulley Block, 40¢.
 Energy Mfg. Co.'s, 20¢.

Holders, File and Tool—

Balz Pat., # doz \$4.00; 25¢.
 Nicholson File Holders, 20¢.

Hollow-Ware—

Iron—

Stove Hollow-Ware—
 Ground, 60¢ to 10¢ to 5¢ to 10¢.
 Unground, 60¢ to 10¢ to 5¢ to 10¢.

Enamelled Hollow-Ware—

Maslin Kettles, 65¢ to 10¢ to 5¢.
 Boilers and Saucepans, 40¢ to 5¢.
 Tinned Boilers and Saucepans, 40¢.
 Gray Enamelled Ware, 50¢ to 10¢ to 5¢.
 Stove, 50¢ to 10¢ to 5¢.
 Maslin Kettles, 60¢ to 10¢ to 5¢ to 10¢.
 Boilers and Saucepans, 40¢ to 5¢.
 Agate and Granite Ware, old list, 25¢.
 Rustless Hollow-Ware, 50¢ to 10¢ to 5¢ to 10¢.
 Galvanized Tea Kettles—

Inch 6 7 8 9
 Each 55¢ 67¢ 85¢ 75¢

Silver Plated—

4 mo. or 5¢ cash in 30 days.
 Reed & Barton, 40¢ to 5¢.
 Meriden Britannia Co., 40¢ to 5¢.
 Simpson, Hall, Miller & Co., 40¢ to 5¢.
 Rogers & Brother, 40¢ to 5¢.
 Hartford Silver Plate Co., 40¢ to 5¢.
 William Rogers Mfg. Co., 40¢ to 5¢.

Hooks—

Cast Iron—

Bird Cage, Sargent's list, 60¢ to 10¢ to 5¢ to 10¢.
 Bird Cage, Reading, 60¢ to 10¢ to 5¢ to 10¢.
 Clothes Line, Sargent's list, 60¢ to 10¢ to 5¢ to 10¢.
 Clothes Line, Reading list, 60¢ to 10¢ to 5¢ to 10¢.

Ceiling, Sargent's list, 55¢ to 10¢ to 5¢ to 10¢.
 Harness, Reading list, 55¢ to 10¢ to 5¢ to 10¢.
 Coat and Hat, Sargent's list, 55¢ to 10¢ to 5¢ to 10¢.
 Coat and Hat, Reading, 50¢ to 10¢ to 5¢ to 10¢.

Wrought Iron—

Cotton, # doz \$1.25.
 Cotton Pat. (N.Y. Mallet & Handle Wks.), 30¢.
 Tassel and Picture (T. & S. Mfg. Co.), 50¢.
 Wrought Staples, Hooks, &c., 60¢ to 10¢ to 5¢ to 10¢.

Wire—

Wire Coat and Hat, Gem, list April, 1886, 45¢.
 Wire Coat and Hat, Miles', list April, 1886, 45¢.
 Indestructible Coat and Hat, 45¢.
 Wire Coat and Hat, Standard, 45¢.
 Belt, 75¢ to 10¢ to 5¢ to 10¢.

Miscellaneous

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.
 Nolin's Grass, # doz \$2.25.
 Bush, 55¢ to 10¢ to 5¢ to 10¢.
 Hooks and Eyes—Malleable Iron, 70¢ to 10¢ to 5¢ to 10¢.
 Hooks and Eyes—Brass, 60¢ to 10¢ to 5¢ to 10¢.
 Fish Hooks, American, 50¢.
 Bench Hooks, See Bench Stops.

Horse Nails—

Nos. 6 7 8 9 10
 Ausable, 28¢ 26¢ 25¢ 24¢ 23¢.
 Clinton, Fin., 24¢ 22¢ 21¢ 20¢ 19¢.
 Essex, 28¢ 26¢ 25¢ 24¢ 23¢.
 Lyra, 25¢ 23¢ 22¢ 21¢ 20¢.
 Snowden, 25¢ 23¢ 22¢ 21¢ 20¢.
 Putnam, 23¢ 21¢ 20¢ 19¢ 18¢.
 1000 lb in year 15¢.
 Vulcan, 23¢ 21¢ 20¢ 19¢ 18¢.
 Northwest, 25¢ 23¢ 22¢ 21¢ 20¢.
 Globe, 23¢ 21¢ 20¢ 19¢ 18¢.
 Boston, 23¢ 21¢ 20¢ 19¢ 18¢.
 A. C., 25¢ 23¢ 22¢ 21¢ 20¢.

C. B.-K.

25¢ 23¢ 22¢ 21¢ 20¢.

Champlain, 28¢ 26¢ 25¢ 24¢ 23¢.

25¢ to 10¢ to 5¢ to 10¢.

New Haven, 28¢ 26¢ 25¢ 24¢ 23¢.

Saranac, 23¢ 21¢ 20¢ 19¢ 18¢.

Champion, 25¢ 23¢ 22¢ 21¢ 20¢.

Capewell, 28¢ 26¢ 25¢ 24¢ 23¢.

Star, 23¢ 21¢ 20¢ 19¢ 18¢.

Anchor, 23¢ 21¢ 20¢ 19¢ 18¢.

Western, 23¢ 21¢ 20¢ 19¢ 18¢.

Empire Bronzed, 14¢ to 5¢.

Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition, 75¢ to 10¢ to 5¢ to 10¢.

Standard, 70¢ to 10¢ to 5¢ to 10¢.

Extra, 60¢ to 10¢ to 5¢ to 10¢.

N. Y. B. & P. Co., Extra, 50¢.

N. Y. B. & P. Co., Dundee, 60¢ to 10¢ to 5¢ to 10¢.

Huskers—

Blair's Adjustable, # gr \$8.00.

Blair's Adjustable Clipper, # gr 7.00.

Indurated Fiber-Ware.

Splittoons, No. 2, # doz, 36.75.

Basins, Ringed, # doz, No. 1, \$3.70.

No. 2, \$3.10; No. 3, \$2.70.

Washtubs, Nested, Nos. 0, 1, 2 and 3 (4).

Foices, # doz, nests, \$16.87.

Keelers, Nested, Nos. 1, 2, 3 and 4 (4).

pieces, # doz, nests, \$8.37.

Butter Bowls, 15, 17 and 19-inch (3).

pieces, # doz, nests, \$6.75.

Liquid Measures, pt., qt., 2 qt. and fun.

(well 4 pieces) # set, \$3.00.

Dry Measures, 1, 2, 4, 8 and 16 qts. (5).

pieces, # set, \$2.25.

See also Patels.

Jack Screws—See Screws.

Kettles—

Brass, 7 to 17 in., # doz, 24¢ 21¢.

Brass larger than 17 in., 26¢ 23¢.

Enamelled and Tea Kettles.

See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1886, 50¢ to 10¢.

Eagle, Cabinet, &c., 33¢ to 2¢.

Hotchkiss' Brass Blanks, 40¢.

Hotchkiss, Copper and Tinned, 40¢.

Hotchkiss' Pad. and Cab., 35¢.

Ratchet Bed Keys, # doz \$4.00, 15¢.

Wollensack Tinned, 50¢ to 10¢.

Knife Sharpeners—

Parkin's

Applewood Handles, # doz \$6.00, 40¢.

Rosewood or Cocobolo, # doz \$9.00, 40¢.

Knives—

Wilson's Butcher Knives, 25¢ to 30¢.

Ames' Butcher Knives, 25¢.

Foster Bros' Butcher, &c., 25¢.

Nichols' Butcher Knives, 40¢ to 10¢.

Ames' Shoe Knives, 20¢ to 25¢.

Ames' Bread Knives, # doz \$1.50, 15¢ to 20¢.

Moran's Shoe and Bread, 20¢.

Hay and Straw, See Hay Knives.

Table and Pocket, See Cutlery.

Corn, Auburn Mfg. Co. Western Pat., \$2.00.

Corn, Auburn Mfg. Co. Crescent, \$3.50.

Knobs—

Door Mineral, 65¢ to 68¢.

Door Por. Jap'd, 75¢ to 78¢.

Door Por. Nickel, \$2.00 to \$2.25.

Door Por. Plated, Nickel, \$2.00 to \$2.25.

Drawer, Porcelain, 60¢ to 10¢ to 5¢ to 10¢.

Hemacite Door Knobs, 40¢ to 10¢ to 5¢ to 10¢.

Yale & Towne Wood, list Dec. 1885, 40¢.

Furniture, Plain, 75¢ gro 10¢, 10¢.

Furniture, Wood Screws, 25¢ to 10¢.

Base, Rubber Tip, 70¢ to 10¢ to 5¢ to 10¢.

Picture, Judd's, 60¢ to 10¢ to 5¢ to 10¢.

Picture, Sargent's, 70¢ to 10¢.

Picture, Hemacite, 35¢ to 5¢.

Shutter, Porcelain, 55¢ to 10¢.

Carriage, Jap., # gro 80¢, 60¢ to 10¢.

Ladles—

Melting, Sargent's, 55¢ to 10¢.

Melting, Reading, 35¢ to 10¢.

Melting, Monroe's Pat., # doz \$4.00, 40¢.

Melting, P. S. & W., 35¢ to 10¢ to 5¢ to 10¢.

Melting, Warner's, 30¢.

Lawn Mowers—

Standard list, 50¢ to 10¢.

Quaker City, 60¢ to 10¢.

Enterprise, 60¢ to 10¢.

Lanterns—

Tubular—

Plain with Guards, # doz, \$4.00 to \$4.25.

Lift Wire, with Guards, \$4.50 to \$4.75.

Square Plain, with Guards, \$4.00 to \$4.25.

5 q. Lift Wire, with Guards, \$4.25 to \$4.50.

Without Guards, 25¢ # doz less.

Miscellaneous.

Police, Small, \$6.00; Medium, \$7.25;

Parker's.....20@25¢
Wilson's.....55¢
Howard's.....40¢
Bonney's.....40¢
Mills Falls.....40¢40¢10¢
Trenton.....40¢5¢40¢10¢
Merrill's.....15¢20¢
Sargent's.....60¢10¢10¢
Bears and Union.....40¢
Double Screw Leg.....60¢10¢
Prentiss.....20¢5¢25¢
Simpson's Adjustable.....40¢
Moore's.....20¢

Save Filters—
Bonney's, Nos. 2 & 3, \$15.00.....40¢10¢
Stearns.....33¢+10¢33¢+10¢1¢
Stearns' Silent Saw Vises.....33¢+33¢
Sargent's.....60¢10¢
Hopkins'..... φ doz \$17.50, 10¢
Reading.....40¢10¢
Wentworth.....20¢10¢
Combination Hand Vises..... φ doz \$42.00
Cowell Hand Vises.....20¢
Bauer's Pipe Vises.....10¢

Wagon Boxes—
Per D.....2¢ $\frac{1}{2}$

Wagon Jacks—
Daisy.....25¢

Washer Cutters—
Smith's Pat..... φ doz \$12.00, 20¢10¢10¢
Johnson's..... φ doz \$11.00, 33¢
Penny's, φ doz Pol. \$14; Jap'd, \$16.00, 55¢
Appleton's..... φ doz \$16.00, 60¢10¢
Bonney's.....50¢10¢

Washers—
Size..... $\frac{1}{8}$ 5-18 $\frac{3}{4}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ 1
Washers.....5¢ 4¢ 3¢ 3¢ 3¢ 3¢
In lots less than 200 D, φ D, add $\frac{1}{8}$ ¢, 5-D
boxes 1¢ to list.

Wedges—
Iron..... φ D 3¢ $\frac{1}{2}$
Steel..... φ D & $\frac{1}{2}$

Well Buckets, Galvanized—
Hill's..... φ doz, 12 qt, \$4.25; 14 qt, \$4.25
Iron Clad..... φ doz, 14 qt, \$4.25+\$4.50
Galy.....\$4.25+\$4.50
Whiting's Wired Top..... φ doz \$4.00@4.25

Well Wheels—
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire—

Iron—
Market,
Br. & Ann., Nos. 0 to 18.....70¢10¢75¢
Cop'd, Nos. 0 to 18.....70¢70¢5¢
Br. & Ann., Nos. 0 to 18.....55¢5¢
Tin'd; Tinned list Nos. 0 to 18.....67¢ $\frac{1}{2}$
Stone,
Br. and Ann'd, Nos. 16 to 18, 72¢ $\frac{1}{2}$
72¢10¢5¢
Bright and Ann'd, Nos. 19 to 26, 75¢
75¢5¢
Br. and Ann'd, Nos. 27 to 36, 76¢10¢5¢
Tinned.....70¢70¢10¢
Tinned Broom Wire.....70¢5¢70¢10¢
Galvanized Fence.....65¢
Annealed Fence, Nos. 8 and 9.....75¢
Annealed Grape, Nos. 10 to 14.....75¢
Br. list Jan. 18, 1884.....15¢20¢
Copper list Jan. 18, 1884.....35¢
Barb Fence.....See Trade Report
Wire on Spools.....65¢
Malin's Steel and Tin'd Wire on Spools.....40¢
Malin's Brass and Cop. Wire on Spools.....30¢
Cast Steel Wire.....50¢
Stub's Steel Wire.....\$6.00 to \$2.30¢
Steel Music Wire, Nos. 12 to 30, 55¢ $\frac{1}{2}$
Picture Wire.....New list, 50¢
Barb Wire Safety Guards..... φ 1000, \$9.00, 25¢
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality,
 φ 100 sq. ft., \$1.80 @ \$1.90
Galvanized Wire Netting.....75¢@75¢5¢

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30¢
Cast Steel.....40¢

Wrenches—
American Adjustable.....40¢
Baxter's Adjustable "S".....40¢10¢10¢
Baxter's Diagonal.....40¢10¢50¢
Coes' Genuine.....55¢3¢
Coes' "Mechanics".....55¢10¢3¢
Girard Standard.....70¢10¢
Machinists' Sterling French Co. 70¢10¢
Lamson & Sessions' Engineers'.....60¢10¢
Lamson & Sessions' Standard.....70¢10¢
Goes' Pattern, Wrought.....
Girard Agricultural.....80¢@80¢5¢
Lamson & Sessions' Agric'l.
Sterling Wrought.....
Bemis' Call's
Pat. Combination.....35¢
Merrick's Pattern.....35¢
Brigg's Pattern.....25¢
Cylinder or Gas Pipe.....43¢5¢
No. 1 Pipe.....20¢10¢
Alken's Pocket (Bright).....\$6.00, 50¢10¢
The Favorite Pocket..... φ doz \$4.00, 40¢
Webster's Pat. Combination.....25¢
Boardman's.....20¢10¢
Always Ready.....25¢5¢
Aligier's Engineer.....50¢
Donohue's Engineer.....20¢10¢
Acme, Bricke.....60¢3¢
Acme, Nickleed.....50¢3¢
Walker's.....55¢3¢
Diamond Steel.....55¢3¢

Wringers, Clothes—
List March 11, 1889, 2¢ cash.

Wrought Iron—
Staples, Hooks, &c., list Jan. 12, 1886,

Molasses Gates—

Stebbin's Pat. 70¢@70¢7½
Stebbin's Genuine 60¢@10¢10½
Stebbin's Tinned Ends 40¢@10¢
Chase's Hard Metal 50¢@10¢
Bush's 20¢
Lincoln's Pattern 70¢@70¢10
Weed's 20¢@10¢
Boss, # doz:
Nos. 1, 87; No. 2, 88; No. 3, 89; No. 4, 90.
\$10.00 60¢@10¢10½

Money Drawers—

doz, \$18.00, 25¢

Muzzles—

Safety # doz, \$3.00, 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny, # keg 70¢@10¢

doz, \$2.50, 25¢

Nail Puller—

Curless Hammer # doz \$9.00

Giant, No. 1 # doz, \$30.00, 10¢

Pellican # doz, \$9.00, 25¢

Boss # doz, \$30.00, 25¢

Lightning # doz \$21.00

Nail Sets—

Square # gr, \$4.00@4.25

Round # gr, \$3.25

Cannon's Diamond Point # gr, \$12.20

Nut Crackers—

Table (H. & B. Mfg. Co.) # doz \$2.00, 10¢

Blake's Pattern # doz \$2.00, 10¢

Turner & Seymour Mfg. Co. # doz \$2.00, 10¢

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex, Hot Pressed, 5.4¢ 5.9¢

Cold Punched, 5.4¢ 5.9¢

In lots less than 100 lb, # lb, add 1/4¢; 1-lb boxes, add 1¢ to list.

Oakum—

Government # lb 7½¢@8¢

U. S. Navy # lb 6½¢@7¢

Navy # lb 5½¢@6½¢

Oilers—

Zinc and Tin 65¢@55¢10¢

Brass and Copper 50¢@10¢10½

Malleable, Hammers, Improved, No. 1, 55¢; No. 2, 54¢; No. 3, 54¢

10¢@10¢10½

Malleable, Hammers, Old Pattern, same list 40¢

Prior's Pat. or "Paragon" Zinc 60¢@10¢

Prior's Pat. or "Paragon" Brass 50¢

Olstead's Tin and Zinc 60¢

Olstead's Brass and Copper 60¢

Broughton's Zinc 60¢

Broughton's Brass 50¢

Packing, Steam—

Rubber—

Standard 80¢@10¢10½

Extra 50¢@10¢60¢

N. Y. B. & P. Co., Standard 50¢@10¢55¢

N. Y. B. & P. Co., Empire 70¢

N. Y. B. & P. Co., Salamander # lb 65¢, 70¢

Jenkins' Standard # lb 80¢, 35¢

Miscellaneous—

American Packing 10¢@11¢

Russia Packing 14¢

Italian Packing 13¢@14¢

Cotton Packing 15¢@17¢

Jute 7¢@8¢

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts 10 12 14

Hill's Light Weight, # doz, \$2.75 3.00 3.25

Hill's Heavy Weight, # doz, 3.00 3.25 3.75

Witting's 3.00 3.25 3.75

Sidney Shephard & Co. 2.80 3.00 3.40

Iron Clad 2.75 3.00 3.25

Fire Buckets 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt # doz \$4.50

Fire, Stable and Milk, 14 qt # doz \$5.85

Pencils—

Faber's Carpenters' high list 50¢

Faber's Round Gilt # gro \$5.35

Dixon's Lead # gro \$4.50

Dixon's Lumber # gro \$6.75

Dixon's Carpenters' 40¢@10¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00; 8 to 9, \$14.00; 10 to 11, \$15.00

Picture Nails—

Brass Head, Sargent's list 50¢@10¢10½

Brass Head, Combination list 50¢@10¢

Porcelain Head, Sargent's list 50¢@10¢10½

Porcelain Head, Combination list 40¢@10¢

Niles' Patent 40¢

Pinking Irons # doz 65¢ net

Pipe, Wrought Iron—

List March 23, 1887.

1½ and under, Plain 50¢

1½ and under, Galvanized 47½¢

1½ and over, Plain 67½¢

1½ and over, Galvanized 58¢

Boiler Tubes, Iron 57½¢

1½ and under 62½¢

3 in. and larger 65¢

Planes and Plane Irons—

Wood Planes—

Molding 50¢@50¢10¢

Jenich, First Quality 60¢@60¢10¢

Bench, Second Quality 60¢@10¢10½

Ballie's (Stanley R. & L. Co.) 40¢@10¢

Iron Planes—

Ballie's (Stanley R. & L. Co.) 40¢@10¢

Miscellaneous Planes (Stanley R. & L. Co.) 20¢@10¢

Victor Planes (Stanley R. & L. Co.) 20¢@10¢

Steele's Iron Planes 35¢@35¢55¢

Meriden Mill Iron Co.'s 30¢@10¢30¢10½

Davis's Iron Planes 30¢@10¢30¢10½

Birmingham Plane Co. 50¢@50¢55¢

Gage Tool Co.'s Self-Setting 30¢@10¢

Chaplin's Iron Planes 40¢@40¢55¢

Sargent's 30¢@10¢30¢10½

Plane Irons—

Plane Irons 20¢@10¢
Plane Irons, Butcher's \$5.00@5.25 to 2¢
Plane Irons, Buck Bros 30¢
Plane Irons, Auburn Tool Co., "This-
tle" 40¢
Sandusky Tool Co. 30¢
Single and Cut 30¢
Double 25¢
L. & J. White 25¢

Pliers and Nippers—

Button's Patent 30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 # doz 20¢@10¢35¢
Humason & Beckley Mfg. Co. 50¢@50¢10¢
Gas Pliers 60¢
Gas Pliers, Custar's Nickel Plated 60¢55¢
Eureka Pliers and Nippers 40¢
Russell's Parallel 25¢
P. S. & W. Cast Steel 50¢
P. S. & W. Tinniers-Cutting Nippers, add 6¢ dis 10¢
Carew's Pat. Wire Cutters 20¢
Morrill's Parallel, # doz, \$12.00 30¢55¢
Cronk's 8 in., \$15.00; 10 in., \$21.00 40¢@40¢55¢

Plumbs and Levels—

Regular List 70¢@10¢70¢10½

Disston's 45¢10¢

Pocket Levels 70¢@10¢70¢10½

Davis' Iron Levels 30¢

Davis' Inclometers 10¢@10¢

Polish, Metal—

Prestoline 20¢@10¢

Krestoline Paste 33¢45¢

Gaston's Silver Compound 33¢45¢

Pokes, Animal—

Bishop's L. X. L. # doz \$6.50

Bishop's O. K. # doz \$5.50

Bishop's Pioneer # doz \$3.75

Bishop's American # doz \$3.50

Poppers, Corn—

Round or Square, 1 qt. # gr \$12.00@15.00

Round or Square, 2 qt. # gr \$25.00@26.00

Post Hole and Tree Augers—

Samson Post Hole Digger, # doz \$30.00

Fletcher Post Hole Augers, # doz \$30. 30¢

Eureka Diggers # doz \$16.00@17.00

Leed's # doz \$8.00@9.00

Vaughan's Post Hole Auger, # doz \$13.00@14.00

Kohler's Little Giant # doz \$15.00

Kohler's Hercules # doz \$15.00

Kohler's New Champion # doz \$9.00

Schneider # doz \$18.00

Ryan's Post Hole Diggers # doz \$24.00

Cronk's Post Bars, # doz \$60.00

Gibbs Post Hole Digger, # doz \$30.00, 50¢

Imperial, # doz, \$15. 45¢

Potato Parers—

White Mountain # doz \$5.00@5.50

Antrim Combination # doz \$8.00

Hoosier # doz \$13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw # doz \$18.00, 20¢@10¢

Disston's Pruning Hook, # doz \$12.00

E. S. Lee & Co.'s Pruning Tools 40¢

Pruning Shears, Henry's Pat. # doz \$3.75@4.00 net

Henry's Pruning Shears, # doz \$4.25@4.50 net

Wheeler, M. & C. Co.'s Combination, # doz \$12.00, 20¢

Dunlap's Saw and Chisel, # doz \$5.50, 30¢

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c. 60¢@10¢

Japanned Screw 60¢@10¢

Brass Screw 60¢@10¢

Japanned Side 60¢@10¢

Japanned Clothes Line 60¢@10¢

Empire Sash Pulley 55¢@60¢

Moore's Sash, Anti-Friction 50¢

Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50 50¢@10¢50¢10½

Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70 50¢

Hay Fork, "P" Common and Pat. 20¢

Bushed 20¢

Hay Fork, Tarbox Pat. Iron 20¢

Hay Fork, Reed's Self-Lubricating 60¢

Shade Rack 45¢

Tackle Blocks See Blocks

Moore's Anti-Friction 5 in. Wheel, # doz \$12.00 40¢

Pumps—

Clarn, Best Makers 50¢@10¢60¢

Pitcher Spout, Best Makers 60¢@10¢60¢

Pitcher Spout, Cheaper Goods 70¢@5¢

Pitcher Spout, 70¢@10¢55¢

Punches—

Saddlers' or Drive, good, # doz 60¢@65¢

Bemis & Call Co.'s Cast Steel Drive 50¢55¢

Bemis & Call Co.'s Springfield Socket 50¢55¢

Spring, good quality # doz \$2.50@2.80

Spring, Leach's Pat. 15¢

Bemis & Call Co.'s Spring and Check 40¢

Solid Tinniers # doz \$11.44 55¢

Tinniers' Hollow Punches 20¢25¢

Rice Hand Punches 15¢

Avery's Revolving 30¢@10¢

Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wrt Brassa, # ft 85¢ 15¢

Sliding Door, Bronze Wrt Iron, # ft 7¢

Sliding Door, Iron, Painted, # foot 4¢, 40¢

Barn Door, Light, in. 3¢

Per 100 feet \$2.00 2.50 3.10, 10¢

B. D. for N. E. Hangers—

Small. Med. Large.

Per 100 feet \$2.15 2.70 3.25, net

Terry's Wrought Iron, # foot 4¢@5¢

Victor Track Rail, 7¢ # foot 50¢55¢

Carrier Steel Rail, # foot 45¢

Moore's Wrought Iron 25¢

Rakes—

Cast Steel, Association goods 65¢

Cast Steel, outside goods 60¢@10¢70¢

Malleable 70¢@70¢55¢

Gibbs Lawn Rake \$12.00, 50¢15¢

Canton Lawn Rake \$9.00, 50¢10¢

St. Madison Prize Bow Brace and Peers 35¢

Fort Madison Steel Tooth Lawn Rake, \$6.00 25¢

Razors—

J. R. Torrey Razor Co. 20¢

Wostenholme and Butcher, \$10.00 to 10¢

Razor Straps—

Genuine Emerson 60¢@60¢55¢

Imitation # doz \$2.00, 20¢10¢55¢

Torrey's 20¢

Badger's Belt and Com # doz \$2.00

Lamont Combination # doz \$4.00

Rivets and Burrs—

Copper 50¢

Iron, list Nov. 17, '87 50¢

Rivet Sets—

50¢@10¢

Rods—

Stair, Brass 25¢25¢

Stair, Black Walnut # doz 40¢

Rollers—

Barn Door, Sargent's list 60¢@1

CURRENT METAL PRICES.

APRIL 24, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square...	\$ 1.90 @ ..
2 to 4 in. x 1/2 to 1 in.	\$ 2.00 @ 2.10¢
Red Iron:	
1 to 2 in. round and square...	\$ 2.30 @ 2.80¢
2 to 4 in. x 1/2 to 1 in.	\$ 2.10 @ 2.20¢
4 1/2 to 6 in. x 1/2 to 1 in.	\$ 2.30 @ 2.80¢
1 to 6 in. x 1/2 to 1 in.	\$ 2.10 @ 2.20¢
Rods—1/2 and 1-1/2 round and sq.	\$ 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12.	\$ 2.30 @ 2.80¢
"Burden Best" Iron, base price,	\$ 3.00 @ ..
Burden's "H. B. & S." Iron, base price,	\$ 2.80 @ ..
"Ulster"	\$ 3.10 @ ..
Norway Rods	\$ 4.00 @ 5.00¢

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Tor Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2¢
Best Cast Steel, base price in small lots.	3 1/2¢
Best Cast Steel Machinery, base price in small lots.	5¢

Sheet Iron from Store.

Common American.	R. G.	Cleaned.
10 to 16.	\$ 2.75 @ 2.80¢	3.25 @ 3.50¢
17 to 20.	\$ 2.85 @ 3.00¢	3.25 @ 3.50¢
21 to 24.	\$ 3.00 @ 3.10¢	3.50 @ ..
25 and 26.	\$ 3.30 @ ..	3.50 @ ..
27.	\$ 3.35 @ 3.37 1/2¢	3.75 @ ..
28.	\$ 3.50 @ ..	4.00 @ ..
B. B.		
Galv'd, 14 to 20.	\$ 4.50 @ ..	4.38 @ ..
Galv'd, 21 to 24.	\$ 4.87 1/2¢ @ ..	4.75 @ ..
Galv'd, 25 to 26.	\$ 5.25 @ ..	5.12 @ ..
Galv'd, 27.	\$ 5.62 1/2¢ @ ..	5.48 @ ..
Galv'd, 28.	\$ 6.00 @ ..	5.85 @ ..
Patent Planished.	\$ 10¢ @ 10¢	B. 9¢
Russia.	\$ 9 1/2¢ @ 10¢	
American Cold Rolled B. B.	\$ 5¢ @ 7 1/2¢	

English Steel from Store.

Best Cast.	\$ 15 @ ..
Extra Cast.	\$ 16 1/2¢ @ ..
Swaged, Cast.	\$ 16 @ ..
Best Double Shear.	\$ 15 @ ..
Blister, 1st quality.	\$ 12 @ ..
German Steel, Best.	\$ 10 @ ..
3d quality.	\$ 9 @ ..
Sheet Cast Steel, 1st quality.	\$ 15 @ ..
3d quality.	\$ 14 @ ..
3d quality.	\$ 12 1/2¢ @ ..

METALS.

Tin.

Banca, Pigs.	\$ 23 @ ..
Straits, Pigs.	\$ 23 1/2¢ @ ..
English, Pigs.	\$ 23 1/4¢ @ ..
Straits in Bars.	\$ 24 @ ..

Tin Plates.

Charcoal Plates.—Bright.	Per box.
Melyn Grade.	\$ 6.00 @ ..
IC, 10 x 14.	\$ 5.75 @ ..
IC, 12 x 12.	\$ 6.00 @ ..
IC, 14 x 20.	\$ 6.00 @ ..
IC, 20 x 28.	\$ 12.50 @ ..
IX, 10 x 14.	\$ 7.25 @ ..
IX, 12 x 12.	\$ 7.50 @ ..
IX, 14 x 20.	\$ 7.50 @ ..
IX, 20 x 28.	\$ 15.00 @ ..
DC, 12 1/2 x 17.	\$ 5.50 @ ..
DX, 12 1/2 x 17.	\$ 7.00 @ ..
Call and Grade.	\$ 5.75 @ ..
IC, 10 x 14.	\$ 6.00 @ ..
IC, 12 x 12.	\$ 6.25 @ ..
IC, 14 x 20.	\$ 6.00 @ ..
IX, 10 x 14.	\$ 7.25 @ ..
IX, 12 x 12.	\$ 7.50 @ ..
IX, 14 x 20.	\$ 7.50 @ ..
Allaway Grade.	\$ 5.00 @ ..
IC, 10 x 14.	\$ 5.12 1/2¢ @ ..
IC, 12 x 12.	\$ 5.25 @ ..
IC, 14 x 20.	\$ 5.12 1/2¢ @ ..
IC, 20 x 28.	\$ 11.00 @ ..
IX, 10 x 14.	\$ 6.00 @ ..
IX, 12 x 12.	\$ 6.25 @ ..
IX, 14 x 20.	\$ 6.00 @ ..
IX, 20 x 28.	\$ 12.00 @ ..
DC, 12 1/2 x 17.	\$ 4.75 @ ..
DX, 12 1/2 x 17.	\$ 5.75 @ ..
Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20.	\$ 4.75 @ ..
10 x 20.	\$ 7.25 @ ..
20 x 28.	\$ 9.75 @ ..
IX, 10 x 14, 14 x 20.	\$ 5.50 @ ..
RV Grade.—IC, 10 x 14, 14 x 20.	\$ 4.40 @ ..
Charcoal Plates.—Terne.	
Dean, Grade.—IC, 14 x 20.	\$ 4.62 1/2¢ @ ..
20 x 28.	\$ 9.00 @ ..
IX, 14 x 20.	\$ 4.40 @ ..
20 x 28.	\$ 11.87 1/2¢ @ ..
Abecarne Grade.—IC, 14 x 20.	\$ 4.25 @ ..
20 x 28.	\$ 8.50 @ ..
IX, 14 x 20.	\$ 5.25 @ ..
20 x 28.	\$ 10.50 @ ..
Tin Boiler Plates.	
LXX, 14 x 26.	112 sheets. \$12.50 @ \$12.75
LXX, 14 x 28.	112 sheets. 12.75 @ ..
LXX, 14 x 31.	112 sheets. 14.25 @ ..

Copper.

Duty: Pig. Bar and Ingot, 4¢; Old Copper, 3¢ 1/2¢. Manufactured (including all articles of which Copper is a component of chief value). 45 % ad valorem.	
Ingot.	
Lake.	@ 16 1/2¢
"Anchor" Brand.	@ 16 ¢

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Over 64 oz.	82 to 64 oz.	16 to 82 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30—72	30—72	30—72	25	25	25	25	25	25	25	25
30—96	30—96	30—96	25	25	25	25	25	25	25	25
36—96	36—96	36—96	25	25	25	25	25	25	25	25
48—96	48—96	48—96	25	25	25	25	25	25	25	25
60—96	60—96	60—96	25	25	25	25	25	25	25	25
84—96	84—96	84—96	25	25	25	25	25	25	25	25
Over 84 in. wide	Over 84 in. wide	Over 84 in. wide	25	25	25	25	25	25	25	25

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz. Per pound. \$0.53 0.30 0.32 0.35 Bolt Copper, 1/2 inch diameter and over, per pound. 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier. 28¢
12 ounce and up to 14 ounce to square foot. 29¢
10 ounce and up to 12 ounce. 31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each. 8¢

Tinning sheets on one side, 30 x 60 each. 80¢

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each. 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each. 13¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each. 12¢

Tinning sheets on one side, other sizes, per square foot. 2 1/2¢

For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888. Net

Seamless Brass and Copper Tubes.

O. G.	N. G.	%	1/2	3/4	1	1 1/2
8-14	6-12	38	34	31	29	25
15	13	39	34	32	31	29
16	14	40	35	33	32	31
17	15	41	36	34	33	32
18	16	42	37	35	34	33
19	17	44	38	36	35	34
20	18-19	45	40	38	37	35
21	20	47	42	40	39	37
22	21	49	43	41	40	38
23	22	51	45	43	42	40
24	23	54	47	45	44	42
25	24	57	50	47	46	44

Copper, Bronze and Gilding Tube, 3¢ 1/2¢ additional.

Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive. 35¢

Plain, above 3 inch. 45¢

Plain, 5-16 inch. 45¢

Plain, 1/2 inch. 60¢

Plain, 3-16 inch. 1.00

Fancy Tubing, Brass, to No. 20, inclusive. 43¢ 1/2¢

Bronze Tubing, 3¢ 1/2¢ more than Brass.

Discount from list. 20 %

Roll and Sheet Brass.

Discount from list. 10 @ 15 %

High Brass Rods.

Over 1 inch diameter. 27¢

1/2 inch to 1 inch diameter, both inclusive. 24¢

No. 8 and less than 1/2 inch diameter. 26¢

Smaller than No. 8. 30¢

Hexagon, Octagon and Square, 2¢ 1/2¢ advance over Round Rods.

Spelter.

Duty: Pig. Bars and Plates, \$1.50 @ 100 lb.

Western Spelter. 54¢ @ 55¢

"Berzenport". 79¢ @ 8¢

Zinc.

Duty: Sheet, 2 1/2¢ @ 100 lb.

600 lb casks. 61¢

Per lb. 7 1/2¢

Lead.

Duty: Pig, \$2 @ 100 lb. Old Lead, 2¢ @ 100 lb. Pipe and Sheets, 3¢ @ 100 lb.

American.	4 1/2¢
Newark.	4 1/2¢
Bar.	4 1/2¢
Pipe, subject to trade discount.	6¢
Tin-Lined Pipe, subject to trade discount.	15¢
Block Tin Pipes, subject to trade discount.	45¢
Sheet, subject to trade discount.	6 1/2¢

Solder.

1/2 @ 1/2 (Guaranteed). 15¢

Extra Wiping. 12 1/2¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson. \$ 13 1/4¢ @ 14¢

Hallett's. @ 13¢

Fittings.

Cast Iron Fittings, Black and Galvanized, Standard sizes.	70&10 %
Cast Iron Fittings, Bushings and Plugs.	75&10 %
Cast Iron Fittings, Flanges.	70&10 %
Malleable Iron Bushings.	75&10 %
Malleable Iron Unions.	67 1/2 %
Malleable Iron American Unions.	65 %
Wrought-Iron Nipples.	70&10 %
Wrought-Iron Couplings.	70 %
Wrought-Iron Long Screws.	70 %
Casing Fittings.	60 %
Malleable Iron Fittings.	25 %

Valves, Cocks, &c.

Iron Body Valves.	70 %
Throttle Valves, Iron Body.	70 %
All-Iron Valves.	65 %
Soldering Gauge Cocks.	60 %
Mississippi Gauge Cocks.	60 %
Register Gauge Cocks.	65 %
Air Cocks and Radiator Air Cocks.	65 %
Steam Gauge Cocks.	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever.	65 %
Globe Oil Cups.	65 %
Common Lubricators.	65 %
Lubricators with Air Cocks.	65 %
Iron Body Lubricators.	60 %
Steam Valves.	65 %
Whistle Valves.	65 %
Water Gauges.	65 %
Brass Expansion Joints.	55 %
Pump Valves.	55 %
Soldering Unions.	65 %
Soldering Nipples.	70 %
Brass Unions (Union Joints).	65 %
Radiator Nipples.	60 %
Fusible Plugs.	60 %
Oil Pumps.	55 %
Self-Acting Air Valves.	65 %
Vacuum Valves.	55 %
Steam Swing Joints.	55 %
Iron Strainers.	55&10 %
Jenkins' Iron Body Valves, except Gate Valves.	60 %
Jenkins' All-Iron Valves, except Gate Valves.	60 %
Jenkins' Iron Body Gate Valves.	55 %
Jenkins' All-Iron Gate Valves.	55 %
Iron Cocks, all iron.	65 %
Iron Cocks, with Brass Plugs.	65 %
Brass Globe, Angle and Cross Valves.	65 %
Brass Globe Valves, Finished.	45 %
Brass Globe and Angle Valves, hose outlet.	65 %
Brass Garden Hose Valves.	60 %
Brass Caps for Hose Valves.	60 %
Brass Horizontal, Vertical and Angle Check Valves.	65 %
Brass Safety Valves.	65 %
Brass Safety Valves, low pressure.	65 %
Brass Safety Valves, low pressure, with balance weight.	65 %
Brass Butterfly Valves.	55 %
Brass Throttle Valves.	55 %
Brass Radiator Valves.	65 %
Brass Radiator Valves, Jenkins'.	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves.	65 %
Brass Jenkins' Gate Valves.	50 %
Brass Steam Cocks.	60 %
Brass Gas, Meter and Union Meter Cocks.	60 %
Brass Fittings, Rough.	60 %
Brass Fittings, Finished.	25 %
Brass Bushings.	60 %

Plumbers' Brass Work.

Ground Key Work, Rough.	60 %
Ground Key Work, Finished.	55 %
Compression Work.	60 %
Compression Work, Grundy. Heavy Pattern.	55 %
Chain Stays.	60 %
Iron Boiler Couplings, Ground Face, per set \$1.	net
Basin Plugs.	60 %
Sink or Bath and Wash Tray Flugs.	60 %
Basin Clamps.	55 %

Paints.

Black, Lamp—Coach Painters	17 @ 22 @ 24¢
" Ordinary	6¢
Black, Ivory Drop, fair	12 @ 15¢
" best	35¢
Black Paint in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	14¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	ass'd cans, 9¢; kegs, 7¢
Green, Chrome	15 @ 25¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	17 @ 24¢
Iron Paint, Brown	17 @ 14¢
Iron Paint, Purple	17 @ 14¢
Iron Paint, Ground in oil, Bright Red	17 @ 14¢
Iron Paint, Ground in oil, Red	17 @ 14¢
Iron Paint, Ground in oil, Brown	17 @ 51¢
Iron Paint, Ground, Purple	17 @ 6¢
Litharge	5¢
Mineral Paints	2 @ 1¢